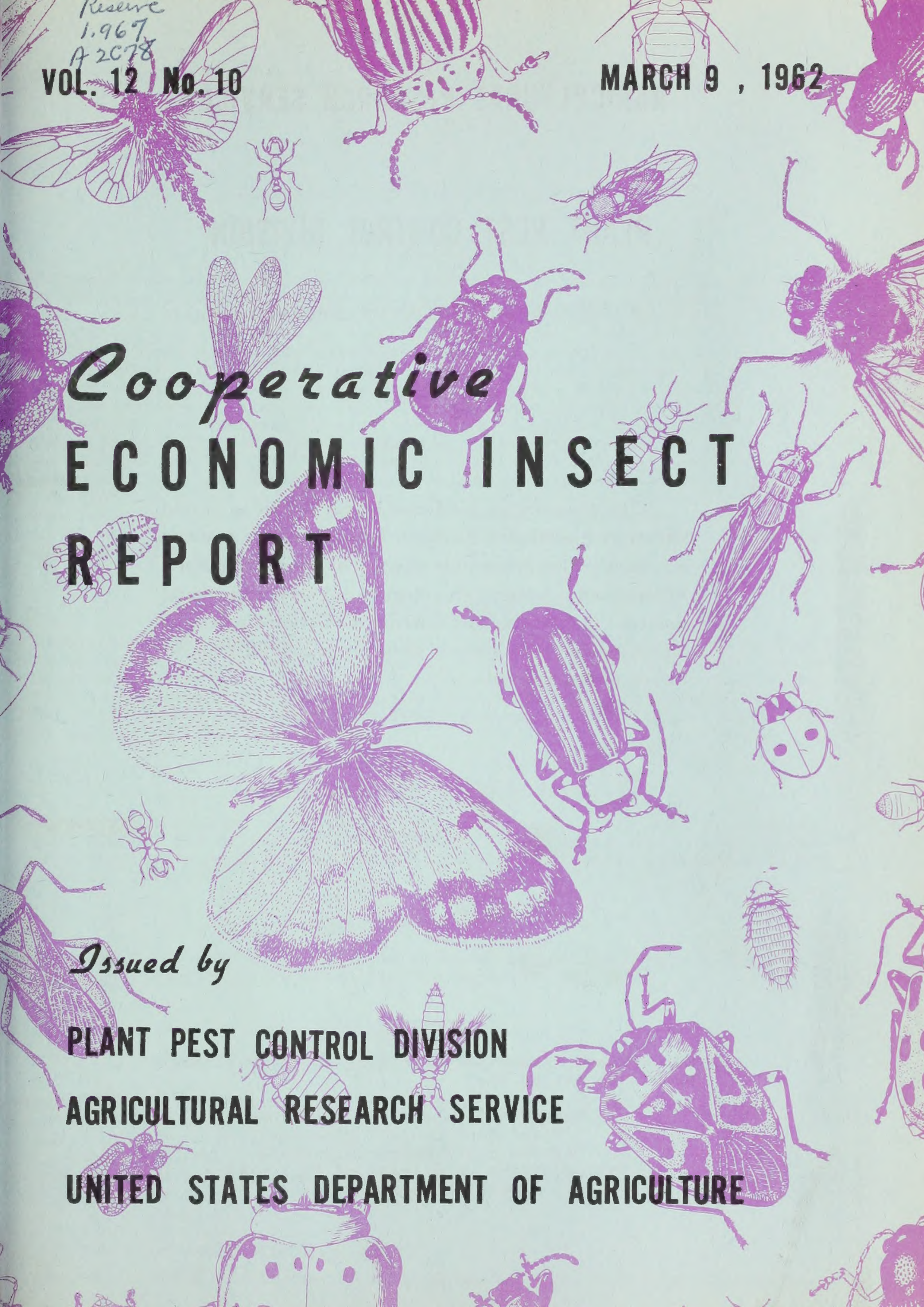
Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Reserve
1.967
A2C78

VOL. 12 No. 10

MARCH 9 , 1962



Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

Volume 12 March 9, 1962 Number 10

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GREENBUG continues at noneconomic levels generally in Texas and Oklahoma. CORN LEAF APHID infestations medium on some central Arizona barley. Some ARMY CUTWORM controls applied locally in Oklahoma. Heavy infestations of an ALFALFA WEEVIL (*Hypera brunneipennis*) present in Yuma County, Arizona, alfalfa; untreated fields on Yuma Mesa almost completely defoliated. (p. 161). GREEN PEACH APHID continues damaging to sugar beets and safflower in central and southwestern Arizona, and populations heaviest in past 4 years in Zavala County, Texas, where they are killing some spinach plants. (p. 162). TURNIP APHID, POTATO APHID and SPOTTED CUCUMBER BEETLE also damaging to truck crops in localities of southern Texas. SOUTHERN PINE BEETLE infestations spread during January in eastern Texas; SMALLER EUROPEAN ELM BARK BEETLE adults heavy on elm locally in Kern County, California; and ELM LEAF BEETLE active in areas of Oklahoma. (p. 163). CATTLE LICE infestations severe in Logan area, Cache County, Utah, and continue to increase throughout Oklahoma; heaviest infestations in Nebraska occur in east central area. (p. 164). SUBTERRANEAN TERMITE infestations reported in Maryland, Delaware and Pennsylvania. (p. 165).

Forecasts of Insect Conditions

Some heavy, localized infestations of HESSIAN FLY expected in wheat in southern Kansas. (p. 161). Survey of spring breeding areas for POTATO PSYLLID in Arizona and California indicates a potentially very severe outbreak this season. (p. 162). CODLING MOTH expected to need major consideration during 1962 in Indiana. (p. 168). RED-BANDED LEAF ROLLER expected to cause injury to apples in Doniphan County, Kansas, in 1962. (p. 169).

Miscellaneous Notes of Interest

Additional information on the SCARAB (*Ceratophyus* sp.), which was reported for the first time in the United States in CEIR 12(7):85, is given. General infestations present on some 50,000 acres in Santa Barbara County, California; 5,000 acres heavily infested. (p. 166).

Insect Detection

EUROPEAN MANTIS reported for first time in Delaware (p. 165) and a NITIDULID (*Carpophilus melanopterus*) reported from Pennsylvania (p. 166).

Special Reports

Potato Psyllid Survey, Spring Breeding Areas of Arizona and California. (p. 162).

Summary of Insect Conditions - 1961 (continued)

FRUIT INSECTS

Deciduous Fruit Tree Insects - (p. 167)
Nut Tree Insects - (p. 181)
Pests of Avocado, Olive and Fig - (p. 184)
Pests of Citrus - (p. 184)
Pests of Grape - (p. 188)
Pests of Bushfruits - (p. 190)

Reports in this issue are for week ending March 2 unless otherwise indicated.

WEATHER OF THE WEEK ENDING MARCH 5

The weather has been cold and snowy in western and northern areas and mild with heavy rains in the Southeast for 2 consecutive weeks.

In the North Central Interior, this week was even colder than the previous week, with record low temperatures for so late in the season occurring at many stations in the upper Mississippi Valley and Great Lakes region. Mott, North Dakota, and Bemidji, Minnesota, recorded -44° on February 26 and March 1, respectively. Minneapolis, Minnesota, had -32° on March 1, the lowest temperature ever recorded there in March. Other low temperatures during the week included -35° at Creighton, Nebraska, -35° at several stations in Iowa, -40° in eastern South Dakota and -34° in Pellston, Michigan.

Subzero minima extended to Oklahoma with a low of -4° at Kenton and freezing to parts of the gulf coast. The freeze may have damaged peaches which were in full bloom in Louisiana and Texas. In Texas, freezing reached extreme southern portions of the State with 29° at Rio Grande City, ending 4 weeks of summerlike weather in that State. Freezing was general over the Far Southwest Interior on February 28, and some crop damage was reported in Arizona. Colder weather in the East near the end of the period brought low temperatures, ranging from suzzero levels at a number of stations in the Northeast to slightly below freezing in northern Georgia.

During the mild weather which prevailed in the Southeast until the weekend, daytime temperatures in the 80's were recorded in North Carolina and a few 90's in the Florida Peninsula. These high temperatures set new records at some stations in North Carolina for the end of February.

Precipitation exceeded a half inch in a large area extending from the southeastern Great Plains eastward and northeastward to the Atlantic coast. Weekly totals generally ranged from 2 to over 4 inches in Tennessee, Kentucky and some surrounding areas where extensive flooding occurred. Most of the precipitation in the East and Southeast occurred as rain early in the week. Rainfall in the southern portion of the Florida Peninsula totaled less than 0.50 inch for the week.

Light to locally heavy snowfall with low temperatures which prevented much melting, kept a heavy snow cover in northern areas east of the Rockies. Depths now range up to 20 inches or more in the Dakotas, 37 in Iowa, 26 in Minnesota, 40 in Wisconsin, 39 in Michigan and 49 inches in New England. Light to locally heavy snowfall was rather widespread in the Far West and the snowpack in the mountains was substantially increased. At Twin Lakes, California, the snow depth increased 38 inches during the week. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

HESSIAN FLY (Phytophaga destructor) - KANSAS - February collections from 63 fields of wheat in 20 southern counties showed only 6 infested. Infestations ranged from 4 to 16 percent. Fall infestations higher in northern area. Resistant varieties and good cultural control practice have greatly reduced Hessian fly potential. However, some heavy, localized infestations expected. Virtually no larval mortality found. (Jones, Somsen, Peters).

A CRANE FLY (Tipula simplex) - CALIFORNIA - Heavy populations continue in pasturelands in Tulare County; light populations reported from Exeter area. (Cal. Coop. Rpt.).

GREENBUG (Toxoptera graminum) - TEXAS - Continues subeconomic; highest counts in panhandle area 5-10 per linear foot of row. (Texas Coop. Rpt.). OKLAHOMA - Populations, although up from 2 weeks ago, remain at noneconomic level (0-10 per linear foot) in wheat in Perkins area, north central section. Counts 20-40 per linear foot in 2 fields in Grandfield area, southwest section; counts 0-10 per linear foot in other fields in same area. Counts in Yuba vicinity, south central area, averaged one per linear foot. Counts in southwest and south central areas made before subfreezing temperatures occurred during week; counts in north central area made later in week. (Okla. Coop. Sur.).

ENGLISH GRAIN APHID (Macrosiphum granarium) - OKLAHOMA - Counts 1.5 per linear foot on wheat in Yuba area; none observed in Perkins area. (Okla. Coop. Sur.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Counts 0-50 per linear foot in wheatfield in Perkins area; populations "colonized" without general coverage of plants in places where high counts were made. (Okla. Coop. Sur.).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Medium infestations present on some central area barley. (Ariz. Coop. Sur.).

BROWN WHEAT MITE (Petrobia latens) - OKLAHOMA - Light on wheat in Bryan County, south central area. (Okla. Coop. Sur.).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Light, up to 10 per linear foot, in wheat in Perkins vicinity, north central area. (Okla. Coop. Sur.).

SOUTHWESTERN CORN BORER (Ziadiatraea grandiosella) - ARKANSAS - Limited surveys in Columbia County, southwest area, indicated approximately 50 percent survival of overwintering larvae to March 3. January temperatures were as low as -5 degrees F.; however, 6-7 inches of snow cover was present. (Ark. Ins. Sur.).

ARMY CUTWORM (Chorizagrotis auxiliaris) - OKLAHOMA - Light populations continue in wheat and alfalfa in central, north central, west central and northwest areas of State. Some treatments applied in Kingfisher area. (Okla. Coop. Sur.).

AN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Heavy infestations severely damaging alfalfa in Yuma County. Counts in untreated fields on the Yuma Mesa averaged 30 larvae per sweep and foliage being almost completely destroyed. Infestations lighter in Yuma and Gila Valleys, but average of 7-15 larvae per sweep present in many fields and damage becoming apparent. Very light infestations present in some central area fields. (Ariz. Coop. Sur.).

ALFALFA WEEVIL (Hypera postica) - NEVADA - No activity to March 2 due to inclement weather; adult activity and egg laying expected to be later than normal. (Coop. Rpt.).

A THRIPS (Frankliniella occidentalis) - ARIZONA - Medium infestations present on alfalfa in central and southwestern areas. Light infestations present in flax and safflower in Yuma County. (Ariz. Coop. Sur.).

PEA APHID (*Macrosiphum pisi*) - NEW MEXICO - Infestations remain relatively light in alfalfa in southern area. (N. M. Coop. Rpt.). OKLAHOMA - Light on alfalfa in parts of north central, south central, southwest and east central areas. Heavy on vetch in Durrant vicinity, south central area, and light on vetch in southeast area. (Okla. Coop. Sur.).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - OKLAHOMA - Populations remain low in Choctaw County, southeast area. Higher counts, 20-35 per square foot, on alfalfa in Tillman County, southwest area. None observed in Perkins vicinity, north central area. (Okla. Coop. Sur.).

TARNISHED PLANT BUG (*Lygus lineolaris*) - OKLAHOMA - Light on alfalfa and vetch in Choctaw County, southeast area. (Okla. Coop. Sur.).

SOUTHERN CORN ROOTWORM (*Diabrotica undecimpunctata howardi*) - OKLAHOMA - Light on alfalfa and vetch in Choctaw County, southeast area. (Okla. Coop. Sur.).

FRUIT INSECTS

APPLE TWIG BORER (*Amphicerus bicaudatus*) - TEXAS - Infestation serious enough on 4 of 8 dooryard apple trees in Baylor County to consider controls. Det. by Burke. (McClung).

TRUCK CROP INSECTS

Potato Psyllid Survey, Spring Breeding Areas of Arizona and California - The potato psyllid (*Paratrioza cockerelli*) survey was conducted February 27 through March 1, 1962, in the overwintering areas of Arizona and California. Weather conditions have apparently been favorable for the development of wild *Lycium* which was succulent and abudant in all areas. Throughout the survey, the weather was cool to warm, clear and calm, except the forenoon of February 27 when rain squalls and cold, cloudy conditions prevailed. Potato psyllid was collected at all stops, with the average counts per 100 sweeps being higher than for any year since the survey began. At many stops, nymphs outnumbered adults by 2 or 3 times. In addition, egg depostition was heavy at about one-half of the stops. *The survey indicates a potentially very severe outbreak this season.* A comparasion of potato psyllid populations found during the spring surveys, 1957 through 1962, is shown in the table below. (PPC, West. Reg.; Mar. 2).

Potato Psyllid Survey on Overwintering Hosts
Average Number per 100 Sweeps

State	District	1962	1961	1960	1959	1958	1957
Arizona	Phoenix-Tucson	2236	149	665	992	93	95
California	Blythe-Barstow	909	41	282	237	96	143

THRIPS - NEW MEXICO - Populations of unspecified species generally light in Dona Ana County onion fields. Counts averaged about 2 per plant in fields checked. (N. M. Coop. Rpt.). TEXAS - *Frankliniella occidentalis* and *Thrips tabaci* averaged 13 per plant on onions in Zavala and Dimmit Counties; nymphs increasing. Controls being applied. (Harding).

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Medium to heavy infestations present on sugar beets and safflower in central and southwestern areas. (Ariz. Coop. Sur.). TEXAS - Populations of over 100 per plant, heaviest seen during past 4 years, killing some spinach plants in Zavala County. (Harding).

CABBAGE APHID (*Brevicoryne brassicae*) - GEORGIA - Light infestations on cabbage in Thomas and Colquitt Counties (Johnson).

TURNIP APHID (*Rhopalosiphum pseudobrassicae*) - TEXAS - Heavy, local infestation (73 per large leaf) on turnips in Dimmit County. (Harding).

POTATO APHID (*Macrosiphum euphorbiae*) - TEXAS - Local infestations averaged 18 per leaf on newly emerged potato plants in Zavala County. (Harding).

SWEETPOTATO WEEVIL (*Cylas formicarius elegantulus*) - FLORIDA - Heavily infested banked seed sweetpotatoes at Hilliard, Nassau County, on February 21 and moderately infested sweetpotatoes 5 miles southeast of Perry, Taylor County, on February 23. (Gladden, Adkins).

SPOTTED CUCUMBER BEETLE (*Diabrotica undecimpunctata howardi*) - TEXAS - Adults heavy enough in Zavala and Dimmit Counties to cause noticeable damage to leaves of spinach and potatoes. (Harding).

A MITE (*Tyrophagus* sp.) - OREGON - Reported severely damaging greenhouse plantings of cucumbers in Jackson County during January. Injury consisted of shot-hole effect on leaf surface of plants. Det. by G. W Krantz. (Berry).

TOBACCO INSECTS

TOBACCO FLEA BEETLE (*Epitrix hirtipennis*) - GEORGIA - Light infestations on tobacco in the plant bed in Thomas, Colquitt and Irwin Counties. (Johnson).

VEGETABLE WEEVIL (*Listroderes costirostris obliquus*) - GEORGIA - Light to moderate infestations on tobacco in the plant bed in Thomas, Colquitt and Irwin Counties. (Johnson).

COTTON INSECTS

PINK BOLLWORM (*Pectinophora gossypiella*) - FLORIDA - Infested 350 wild cotton plants at Everglades National Park, Cape Sable, Dade County, on February 25 and 175 bolls and 5 blooms at Plantation Key, Monroe County, on February 26. (Weaver, Creamer).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (*Dendroctonus frontalis*) - TEXAS - Infestations spread during January in spite of low temperatures experienced. An aerial flight on January 16 located 41 new spots. Each new spot had 5 or more trees with brown tops. Ground observations revealed many single trees with green foliage that were undetectable from the air. Three spots outside the previously known epidemic area reported; 2 in Polk County and one in Tyler County. Some landowners continued treatments on accessible sites. (Texas For. Pest Comm.; Jan.Rpt.).

BLACK TURPENTINE BEETLE (*Dendroctonus terebrans*) - TEXAS - Reported active on pines in Montgomery, Sabine and Walker Counties. (Texas For. Pest Comm.; Jan.Rpt.).

NANTUCKET PINE TIP MOTH (*Rhyacionia frustrana*) - ARKANSAS - First adult emergence of season occurred in southern area during week ending February 24. (Ark. Ins. Sur.).

SMALLER EUROPEAN ELM BARK BEETLE (*Scolytus multistriatus*) - CALIFORNIA - Adults heavy in elm bark in Bakersfield, Kern County. (Cal. Coop. Rpt.).

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - OKLAHOMA - Reported on elm trees in Woodward County, northwest area. Some activity continues around hibernation quarters in Stillwater area. (Okla. Coop. Sur.).

NATIVE HOLLY LEAF MINER (*Phytomyza ilicicola*) - MARYLAND - Several heavy infestations noted on American holly locally in Prince Georges County. (U. Md., Ent. Dept.).

WILLOW BEAKED-GALL MIDGE (Phytophaga rigidae) - PENNSYLVANIA - Most twigs of pussy willow infested in Allegheny County. (Udine).

A GALL WASP (Callirhytis punctata) - PENNSYLVANIA - Galls present on oaks 8 feet high at Meridian, Butler County, on February 20. (Simons).

COCCIDS - California - Parlatoria pittospori light on Callitris sp. in Mission Bay City Park, San Diego, San Diego County. (Cal. Coop. Rpt.). MISSOURI - A coccid, probably Asterolecanium variolosum, moderate to heavy on pin oak in a parking lot in Clayton, east central area. (Lenhardt). TEXAS - Unaspis euonymi heavy and causing loss of some euonymus plants in Vernon area of Wilbarger County. (Thomas). OKLAHOMA - U. euonymi reported on shrubs in Choctaw, Mayes and Stephens Counties. (Okla. Coop. Sur.). FLORIDA - Aonidiella taxus infested 50 podocarpus plants at Clermont, Lake County, on February 21 (Hey, Henderson, Fatic); Aspidiotus lataniae collected on common seagrape on Loggerhead Key on January 11 (Denmark, Caldwell); Ceroplastes cirripediformis moderate on cape-honeysuckle at Opa Locka, Dade County, on February 16 (McMillan, Dowling); C. floridensis light on yucca at Vero Beach, Indian River County, and on key lime at Ft. Myers, Lee County, on February 21 (Kendrick, Walsh); Chrysomphalus aonidum infestations moderate to severe on Schefflera sp. at Merritt Island, Brevard County, on February 2 and light on yucca at Vero Beach and key lime at Ft. Myers on February 21 (Levan, Kendrick, Walsh); Diaspis boisduvalli light on queenpalm at New Smyrna Beach, Volusia County, on February 19 and moderately infesting holyghostflower (Peristeria elata) at Homestead, Dade County, on February 22 (Smith, Knowles); Eucalymnatus tessellatus, Fiorinia fioriniae and Protopulvinaria pyriformis infested ricepaperplant at Cypress Gardens, Polk County, on January 16 (Eberenz, Pott); Lepidosaphes beckii infested key lime at Ft. Myers, Lee County, on February 21 (Walsh); and Pinnaspis strachani moderately infested a palm at Opa Locka, Dade County, on February 16 (McMillan Dowling). MARYLAND - Aspidiotus sp. infested Austrian pine and Phenacaspis pinifoliae was heavy on needles of ornamental white pines at College Park, Prince Georges County. (U. Md., Ent. Dept.; Feb. 22-23). PENNSYLVANIA - Unaspis euonymi collected on bittersweet and Aspidiotus juglansregiae on Ohio buckeye on February 13 at University Park, Centre County. (Sleesman).

MITES - FLORIDA - Brevipalpus sp. and Oligonychus ilicis severely infesting azalea at Jacksonville, Duval County, on February 8. (King). CALIFORNIA - Heavy infestation of Bryobia spica on Scotch-broom in a nursery property in Fortuna, Humboldt County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (Hypoderma spp.) - NEVADA - H. lineatum dropping from backs of cattle in upper Dixie Valley, Churchill County. H. bovis appearing in backs of cattle in southeast Pershing County. (Lauderdale). Hypoderma sp. beginning to appear in backs of cattle in Elko County. (Arnett). OKLAHOMA - H. lineatum populations continue to decrease throughout State. (Okla. Coop. Sur.). NEBRASKA - Grubs ranged 3-15 (average 6) on calves and bulls at livestock sales barn in Garfield County. Most grubs small; just appearing on animals. Six calves with 131 grubs and 14 cows with 157 grubs in Custer County. (Bergman, Roselle, Feb. 26).

A MOSQUITO (Aedes canadensis) - DELAWARE - First larvae of season collected at Coochs Bridge, New Castle County, on February 24 from woodland pools. (Lake).

CATTLE LICE - UTAH - Severe infestations on number of beef bulls in Logan area of Cache County. (Knowlton, Haws). OKLAHOMA - Populations continue to increase throughout State. (Okla. Coop. Sur.). NEBRASKA - Heaviest infestations occur in east central area, infestations light elsewhere; hair deposited by cattle scratching on fences not frequently found. (Bergman, Feb. 26).

HOUSEHOLD AND STRUCTURAL INSECTS

SUBTERRANEAN TERMITES - OREGON - Reticulitermes tibialis collected at Coquille on December 1, 1961, by G. Jenkins. Det. by T. E. Snyder. This species uncommon in State. (Every). MARYLAND - Reticulitermes sp. damage to a floor noted in a home at Annapolis, Anne Arundel County. (U. Md., Ent. Dept.). DELAWARE - Severe infestation of R. flavipes located in large building in New Castle County. (Burbutis). PENNSYLVANIA - R. flavipes infesting a home in New Cumberland, Cumberland County, on February 14. (Balsbaugh).

BROWN-BANDED COCKROACH (Supella supellectilium) - OREGON - Infestation reported from Hermiston February 12; a new area record for this species. (Every).

A DARKLING BEETLE (Blapstinus sp.) - CALIFORNIA - A household nuisance in El Cajon and heavy in a yard in National City, San Diego County. (Cal. Coop. Rpt.).

BLACK CARPET BEETLE (Attagenus piceus) - DELAWARE - Several new infestations reported in homes in New Castle County. (Burbutis).

SPIDER BEETLES (Ptinus spp.) - OKLAHOMA - Ptinus sp. causing some concern around home in Stillwater area. (Okla. Coop. Sur.). CALIFRONIA - Heavy population of P. clavipes in a residence in Byron, Contra Costa County. (Cal. Coop. Rpt.).

ELM LEAF BEETLE (Galerucella xanthomelaena) - CALIFORNIA - Hibernating adults numerous inside attic of a building in Talmage, Mendocino County. (Cal.Coop.Rpt.).

A CERAMBYCID (Smodicum cucujiforme) - PENNSYLVANIA - Found all over a home in Montgomery County. Det. Wayne Boyle. (Menusan).

BOXELDER BUG (Leptocoris trivittatus) - MARYLAND - Caused a nuisance in a home at Union Bridge, Carroll County. (U. Md., Ent. Dept.).

INDIAN-MEAL MOTH (Plodia interpunctella) - PENNSYLVANIA - Heavy infestation reported in store in Philadelphia on February 21; fog treatment not satisfactory. (Munusan). Reported numerous locally in homes in Cumberland and Somerset Counties. (Pepper, Udine; Feb. 23-26).

THIEF ANT (Solenopsis molesta) - PENNSYLVANIA - A nuisance in homes locally in York and Centre Counties. (Pepper).

CLOVER MITE (Bryobia praetiosa) - NEVADA - Large numbers entering homes in southern Washoe County. (Coop. Rpt.).

BROWN DOG TICK (Rhipicephalus sanguineus) - MARYLAND - Appeared in homes in Kingsville and Lutherville, Baltimore County, on February 19 and 26. (U. Md., Ent. Dept.).

STORED-PRODUCT INSECTS

A VINEGAR FLY (Drosophila hydei) - CALIFORNIA - Adults heavy in stored sweetpotatoes in San Luis Rey, San Diego County. (Cal. Coop. Rpt.).

BENEFICIAL INSECTS

EUROPEAN MANTIS (Mantis religiosa) - DELAWARE - Collected by A. Mason on September 18, 1961, at Newark, New Castle County. Det. by A. B. Gurney. This is a new State record. (Burbutis).

DAMSEL BUGS (Nabis spp.) - OKLAHOMA - Light populations, up to 2 per linear foot on wheat in Perkins area; lighter on alfalfa in southeastern area. (Okla. Coop. Sur.).

LADY BEETLES - OKLAHOMA - Becoming more common in wheat and alfalfa in southwest, southeast and north central areas. (Okla. Coop. Sur.).

MISCELLANEOUS INSECTS

A SCARAB (*Ceratophyus* sp.) - CALIFORNIA - This scarab which was reported for the first time in CEIR 12(7):85 has been nicknamed the "gopher beetle" in California because of the mounds thrown up from subterranean boring. Mounds are 2-5 inches high and 6 inches wide at the base. As many as 12 per square yard occur around the golf course at Vandenberg AFB in Santa Barbara County. Tunnels in the soil are smooth and well packed, going down 6 feet or more. Approximately 5,000 acres are heavily infested in spotty, general infestations of some 50,000 acres, an area of about 9 by 12 miles. Most mounds are in heavy brush with a few in turf and lawn areas. Apparently the beetle prefers undisturbed areas under scrub oaks and native brush. (Cal. Coop. Rpt.).

A SCARAB (*Anomala nigropicta*) - FLORIDA - Appeared in abundance throughout State from Miami to Jacksonville. Observed feeding on wisteria at dusk in Gainesville, Alachua County, and damaging foliage of grapefurit at Clearwater, Pinellas County. (Fla. Coop. Sur.; Feb. 15).

A NITIDULID (*Carpophilus melanopterus*) - PENNSYLVANIA - Collected on June 28, 1958, by E. E. Simons at Feasterville, Bucks County; host not known. Det. by E. U. Balsbaugh. (Simons, Balsbaugh). This is first published record of species in State. However, *C. melanopterus* previously collected at West Grove, Chester County, July 6, 1952, but not published. *C. melanopterus* known to develop in flowers of *Yucca filamentosa*, where it mines petals and other floral parts. The range of *C. melanopterus* may be restricted by distribution of *Y. filamentosa*, but it probably occurs wherever *Y. filamentosa* is found. (Connell).

RED-HEADED ASH BORER (*Neoclytus acuminatus*) - PENNSYLVANIA - Numerous adults present on February 23 at a lumber mill in McKean County (Adams); also reported in home locally in Allegheny County on February 14 and Cumberland County on February 25. (Pepper, Balsbaugh).

LIGHT TRAP COLLECTIONS

	Pseudaletia unipuncta	Prodenia ornithogalli	Agrotis ipsilon	Feltia subterranea
FLORIDA				
Quincy 2/26	3		1	5
Gainesville 2/22	1	2	3	37
SOUTH CAROLINA				
Charleston 2/19-25	7	6	5	23
Charleston 2/26-3/4	9	6	1	14

SUMMARY OF INSECT CONDITIONS - 1961

(Continued from page 158)

FRUIT INSECTS

Deciduous Fruit Tree Insects

Highlights: Like many other pests of fruits, CODLING MOTH was generally noneconomic during the 1961 season, with damage almost entirely limited to neglected or untreated orchards. This pest is expected to require major consideration during 1962 in Indiana and also poses a potential threat in Kansas and New Mexico. EYE-SPOTTED BUD MOTH populations were again high in Wisconsin, and flight of ORIENTAL FRUIT MOTH was heavy in orchards in Indiana where complete control was not obtained in 1960. This pest was less important in Arkansas during 1961 than in 1960. RED-BANDED LEAF ROLLER populations were generally below average, but some damage did occur in several eastern areas. An unusually heavy brood of FRUIT-TREE LEAF ROLLER appeared in Missouri. PEACH TREE BORER was heavy in many orchards in the Peach Belt of Georgia, resulting in considerable damage to peaches. General infestations of this pest were heavier in Georgia than during 1960 and heavier than in an average year. LESSER PEACH TREE BORER was a problem in several states, and WESTERN PEACH TREE BORER continued to be a problem in Utah, Oregon and Washington. PEACH TWIG BORER caused more damage during 1961 in Utah than in any previous year, was the main insect pest of peaches in Colorado, and was damaging to peaches throughout New Mexico and California. PLUM CURCULIO was locally heavy in Texas, Oklahoma and Virginia and injury by the pest was somewhat higher than in 1960 in Arkansas, Missouri, Illinois and Indiana. APPLE APHID was a major problem in areas of New England and was abundant in areas of other states from Ohio to California. ROSY APPLE APHID, GREEN PEACH APHID, BLACK CHERRY APHID and WOOLLY APPLE APHID were also damaging and became a problem in certain areas. PEAR PSYLLA, in general, was a problem in untreated pear orchards in the Willamette Valley of Oregon, required considerable control in California, was more abundant and difficult to control in the Yakima Valley of Washington, and was particularly heavy on pears in the Moscow area of Latah County, Idaho, during July. SAN JOSE SCALE was extremely heavy in a number of apple orchards in four counties of New Mexico. APPLE MAGGOT was generally not troublesome in 1961. EUROPEAN APPLE SAWFLY was recorded for the first time in Berkshire County, Massachusetts, and was more abundant than usual in Connecticut. PEAR-SLUG was especially heavy at Dundee and Albany, Oregon, and was particularly damaging to pear and cherry trees in many parts of southeastern Idaho. APPLE RUST MITE severely damaged pears for the first time in the Wenatchee River Valley of Washington during the 1961 season. ORCHARD MITES, generally, were not serious during 1961, although they were a problem in certain areas.

****

Light numbers of CODLING MOTH (Carpocapsa pomonella) were taken in bait traps in New Gloucester, Cumberland County, MAINE. First-brood activity was delayed 10 days beyond normal this season in Maine by weather conditions. Codling moth remained at low population levels throughout NEW HAMPSHIRE, and activity was down from previous years in VERMONT due to cool weather. However, emergence was prolonged in the latter State, resulting in a potential threat for several weeks, with high populations being present in some areas. Codling moth decreased from average population levels in eastern MASSACHUSETTS and was present in usual low abundance in CONNECTICUT during the 1961 season. The summer brood showed a definite increase in NEW YORK, but damage was negligible except in orchards where resistance to a chlorinated hydrocarbon appeared for the first time in the Hudson Valley. A hot summer aided development of the pest in the State. A generally cool, wet spring and early summer in NEW JERSEY resulted in easier first-brood codling moth control in May and June. The second brood caused some damage in orchards in that State, where controls for first brood were not adequate. Codling moth caused injury in one or two orchards during September in DELAWARE when controls ceased in early August, but generally control was excellent where regular protection schedules were followed. Emergence in western MARYLAND was delayed by cold spring temperatures, and injury in well-treated orchards was extremely light. Codling moth was below average abundance in northern VIRGINIA during 1961.

Codling moth infestations were generally severe in neglected and poorly treated orchards in MINNESOTA during 1961. Control was excellent in commercial orchards where applications began during the petal-fall stage. Second generation was controlled in Minnesota, with few new infestations observed during the latter part of the season. In WISCONSIN, several codling moth adults were caught in blacklight traps at Gays Mills, Crawford County, on May 31, but major first-brood flight in that area occurred on June 5. Second-brood moths began emerging on July 21 in Dane County. Populations in Wisconsin were comparable to those of 1960. The spring brood of codling moth never developed to a serious extent in MICHIGAN, presumably because of cool nights. Low initial populations and a cool growing season combined to keep codling moth damage at a low level in OHIO throughout 1961. Codling moth is expected to need major consideration during 1962 in INDIANA. Torrential rains in the southern area of that State during late bloom resulted in a serious scab problem. The many lesions on the fruit provided easy entrance for young codling moth larvae, with the result that some orchards had 20 percent infestations in spite of control programs. In ILLINOIS, cool weather occurred after adults began to appear, thus lengthening the egg-laying period, but damage by codling moth was held to a normal amount. The first adult codling moth was taken in a trap in southeastern MISSOURI on May 15, but, in general, statewide infestations were very light and easily controlled. Second and partial third broods appeared, but both were extremely light and difficult to detect.

Codling moth infestations in commercial orchards in KANSAS were light during 1961, with only occasional injury. Low initial populations, aided by cool weather and heavy rains, were slow and late to develop. However, there is a potential for codling moth to cause injury during the 1962 season. Apples in unsprayed check plots in a well-treated orchard averaged 23.7 percent "wormy", while apples in an untreated orchard averaged 75 percent "wormy." In NEW MEXICO, "orchard run" apples ranged 20-80 percent infested with codling moth throughout the State. Frost killed a majority of the fruit in many areas of the State to the point where growers felt they could not afford to conduct necessary control programs. Control of codling moth on apples in COLORADO was exceptionally good during 1961, being 98-100 percent effective. There were some control failures reported in 3 counties during the latter part of the season, usually when growers were on an extended treatment schedule, such as 16-18 days. Control ranged 95-100 percent effective on pears, and some trouble with certain materials was experienced late in the season. Codling moth infestations in orchards in UTAH treated with a certain chlorinated hydrocarbon were as high as 30 percent or more, but infestation was less than 5 percent in orchards treated with certain phosphates. Untreated or poorly-treated orchards were often 100 percent "wormy." Early broods of codling moth were light in Utah, most infestations coming from late-season populations.

Codling moth continued common to abundant in apple orchards throughout IDAHO, with moderate to heavy infestations restricted generally to neglected orchards. Second-generation larvae were reported entering fruit in the Emmett area, Gem County, on July 26. The pest was also reported infesting plums in the Moscow area of Latah County in late summer. Codling moth adults began emerging by May 10 in Jackson County, OREGON. First adults were caught in blacklight traps in Marion County on June 1, and in bait pans in Hood River on May 28. Damage to fruit in Oregon was almost entirely confined to untreated orchards during the 1961 season. Continued moth activity in late August necessitated a fourth cover in the Willamette Valley. Codling moth populations in Yakima Valley orchards of WASHINGTON were slightly lower than normal during 1961, probably due to continuous cool weather during May. A partial third brood was produced in the Wenatchee area of Chelan County and populations were heavier than normal in a few orchards. Codling moth was generally light on apples and pears in CALIFORNIA during 1961, with a few local heavy populations developing statewide.

ORIENTAL FRUIT MOTH (Grapholitha molesta) population decreased from average levels in CONNECTICUT in 1961, being very low in abundance as compared with 1960. Infestations in GEORGIA during this year were not as heavy as in 1960, very few reports of damage being received. General infestations in the State were less than for an average year. Oriental fruit moth was generally light throughout OHIO, but commercial damage was encountered in some orchards in the Lake Erie fruit-growing belt. Excellent control of oriental fruit moth was obtained in commercial orchards in the Vincennes area of INDIANA, but spring-brood flight was heavy in orchards where complete control was not obtained in 1960. Very cool weather occurred in ILLINOIS after many oriental fruit moth adults had emerged, thus hindering egg laying and reducing populations. The pest was well controlled in that State for the 1961 season. Oriental fruit moth was scarce or absent in MISSOURI early in the 1961 season. First larvae appeared in peach terminals in the southeastern area of the State on June 1, but populations were light all season. In ARKANSAS, the pest was less important than during 1960. Excellent control of oriental fruit moth was obtained in 2 orchards in the Wichita area of Sedgwick County, KANSAS, where 90 percent or more of the fruit was destroyed during 1960. One orchard, composed of late-maturing varieties, had nearly 50 percent of the fruit "wormy." In NEBRASKA, oriental fruit moth activity was common in Crete, Saline County, in June. Oriental fruit moth was spotty throughout western IDAHO during 1961, damaging 95 percent of the fruit in a small orchard near Parma, Canyon County, which had been damaged by frost in the spring. This pest required treatment in peach orchards in local areas of San Joaquin, Sutter, Butte and Stanislaus Counties, CALIFORNIA, during the 1961 season, and some fruit damage occurred.

LESSER APPLEWORM (Grapholitha prunivora) was important for the second consecutive year in some orchards in INDIANA, with normal treatment schedules apparently exerting little control, but CHERRY FRUITWORM (Grapholitha packardi) was uncommon in UTAH during the 1961 season.

Light to moderate infestations of EYE-SPOTTED BUD MOTH (Spilonota ocellana) appeared in apple orchards in the Willamette Valley, OREGON, during April, with adult emergence beginning June 8. Larvae entered buds by May 26 in Door County, WISCONSIN, and adults were noted in cherry and apple in that county on June 28. Populations were again high in Wisconsin, compared with those of 1960. Eye-spotted bud moth appeared in 2 additional orchards not previously infested in the Champlain Valley of NEW YORK. Activity of this pest was lower than average in VERMONT and populations remained at low levels throughout NEW HAMPSHIRE during 1961. Infestations of eye-spotted bud moth were light in MAINE during the 1961 season, but were reported from numerous areas. Overwintering larvae were still in hibernation on May 10, and larvae of the summer generation were reported the week ending August 4 in Turner, Androscoggin County. UNSPOTTED TENTIFORM LEAF MINER (Callisto geminatella) was present, but very light, during 1961 in ILLINOIS; however, one block of commercial apple trees was defoliated. There were no reports of this pest in MISSOURI during 1961, and it is presumed to be absent from the State.

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) infestations were generally light in KANSAS, but increased late in the season, causing 12.6 percent injury to Jonathan apples in one orchard in Doniphan County. Large numbers of larvae in the leaves in October indicate potential injury in 1962. No infestations of this pest have been found on peaches in Kansas. Populations of red-banded leaf roller were very light in all generations in MISSOURI during 1961, although the third-generation population did increase slightly. Red-banded leaf roller was present in southeastern MINNESOTA during 1961, but no serious damage was known to occur. Eggs of this pest began hatching June 3 in Door County, WISCONSIN, and a total of 78 adults was caught in blacklight traps at Gays Mills, Crawford County, from June 27 through July 2. First adults of the second generation were trapped in Door County on July 10, with 385 caught on the nights of July 25 and 26. Red-banded leaf roller populations were higher during 1961 than in 1960 in Wisconsin. Very cool weather occurred in ILLINOIS after many red-banded leaf roller moths had emerged, which hindered egg laying and reduced populations. The pest was well controlled for the 1961 season and injury was not serious in the southeastern part of the State. Red-banded leaf roller populations in INDIANA during 1961 were low and easily contained by regular control schedules. The pest was a local problem in a few areas of MICHIGAN during August, but, in general, was of little difficulty. Infestations in OHIO were generally light on apple, peach and plum, but light damage was noted in many apple orchards.

Red-banded leaf roller was below average in abundance in northern VIRGINIA in 1961, but there was some damage to fruit by second-generation larvae in July. The third generation was sufficiently abundant in some orchards to stimulate controls during late August or early September. This pest caused less injury to apples in central Virginia than during the 1960 season. Damage by red-banded leaf roller was kept to a minimum in commercial orchards in western MARYLAND during 1961 by regular control measures, and the pest was never a problem in treated orchards in DELAWARE. Commercial damage by red-banded leaf roller was reported from southern Orange County, NEW YORK, possibly due to resistance to controls. Second brood was more active in the Champlain Valley than for the previous 2-3 years, damage being general but not heavy. Populations were generally at low levels in the Hudson Valley. Red-banded leaf roller was generally distributed in CONNECTICUT during 1961, second-brood injury being severe in Niantic, New London County, and in Southington, Hartford County. Red-banded leaf roller populations were low in MASSACHUSETTS, except in a few locations, and an unusual outbreak occurred in one orchard in Essex County. Activity of red-banded leaf roller was lower than average in VERMONT during 1961, and populations remained at low levels throughout NEW HAMPSHIRE, although an unusual outbreak on apples in the latter State was widely distributed. Light to moderate red-banded leaf roller infestations were present in various areas of MAINE during 1961, with moderate infestations being well controlled. The second brood hatched in early August in that State.

FRUIT-TREE LEAF ROLLER (Archips argyrospilus) populations of average levels failed to develop as expected in the Hudson Valley of NEW YORK during the 1961 season. This leaf roller increased in several orchards in NEW JERSEY during 1960 and was evident in more orchards in 1961 from the central area northward. Where lead arsenate was the only insecticide used on apples in the petal-fall first-cover period, extensive damage was observed. When a phosphate was used before the first spray, control was satisfactory. Fruit-tree leaf roller was present in moderate numbers in neglected orchards in MINNESOTA. Eggs began hatching in Door County, WISCONSIN, on May 11, and were common during the fourth week of May. Second-generation adults were first trapped in Door County on July 10. Fruit-tree leaf roller, which has shown an increase during the past 3 years in ILLINOIS, was not found in the State during 1961. An unusual heavy brood of fruit-tree leaf roller appeared during late May in MISSOURI, being particularly noticeable in terminal foliage of young apple trees, although very few were found on treated trees. This was the heaviest brood of this pest in the State in many years, although a moderately heavy moth flight was recorded in 1960. Populations of fruit-tree leaf roller were much lower in apple orchards in Taos County, NEW MEXICO, during 1961 than in the previous 2 years, with only an occasional light infestation being found.

OBLIQUE-BANDED LEAF ROLLER (Archips rosaceanus) larvae were common in orchards in Marion County, OREGON, beginning in late April, and adults appeared June 5. In COLORADO, undetermined LEAF ROLLER MOTHS were of little economic importance on apples where a treatment program was followed. Occasional damage to peach fruit occurred, particularly in Mesa County, where injury by this group of pests was noted for the first time. An undetermined species of leaf roller was very abundant in 2 apple orchards in Albemarle County, VIRGINIA, from July to the end of the 1961 season. Most feeding was on the foliage, with injury to fruit not serious. An unusual outbreak of a complex of leaf rollers occurred in CONNECTICUT, due partly to weather.

Infestation of PEACH TREE BORER (Sanninoidea exitiosa) was heavy in many orchards in the Peach Belt of GEORGIA during 1961 and considerable damage to peach trees resulted. The general infestation was heavier than in 1960 and again heavier than an average year. Control of this pest is still the number one peach insect problem in Georgia. However, populations were extremely low during 1961 in western MARYLAND. Peach tree borer infestations were low in most commercial orchards in OHIO during 1961, relatively unimportant this season in INDIANA, and not serious in MISSOURI. Peach tree borer was less important on peaches in ARKANSAS, due to excellent control methods, and was well under control in most commercial orchards in KANSAS where treatments were applied. Borers did cause considerable damage to peach in nurseries in Kansas during 1961. Infestations of peach tree borer in Cochise County, ARIZONA, were light on peaches compared with 1960, and damage by this pest was general in stone-fruit orchards in UTAH.

WESTERN PEACH TREE BORER (Sanninoidea exitiosa graefi) was heavy in peaches, prunes and apricots in the lower portion of the Yakima Valley, WASHINGTON, and continued a serious pest in the growing areas of northern Willamette Valley and Milton-Freewater area of Umatilla County, OREGON. Populations of this pest were medium to heavy in home orchards in Siskiyou County, CALIFORNIA, and damage to stone fruits was general in UTAH during 1961.

LESSER PEACH TREE BORER (Synanthedon pictipes) infestations in the Peach Belt of GEORGIA appeared to be like those of 1960, which was somewhat less than in previous years. This may be partly due to less winter injury in 1960 and 1961. This pest was a problem in some areas of TEXAS during 1961, especially on young budded trees in Titus County, and was a problem in some orchards in MISSOURI. Lesser peach tree borer caused moderate to severe injury in a large number of orchards in INDIANA and was a serious problem in many OHIO orchards, particularly in those where soil type and drainage were problems. This pest increased in abundance and caused more damage in several sections of VIRGINIA during 1961, especially in eastern areas.

STALK BORER (Papaipema nebris) infested peach suckers during mid-July in RHODE ISLAND, and an unusually abundant outbreak of GREEN FRUITWORM (Lithophane antennata) caused 10-15 percent damage in an orchard in Ulster County, NEW YORK. In TEXAS, a female of a NOCTUID (Psychomorpha epimenis), was collected in Brazos County.

PEACH TWIG BORER (Anarsia lineatella) was reported entering fruit in peach orchards in the Eugene area of Lane County, OREGON, August 10-15. Prunes were infested in Marion and Polk Counties, in all cases in uncared for orchards. Peach twig borer caused considerable damage to all deciduous fruit trees over CALIFORNIA this season. The problem persisted all year, requiring control, and in some locations fruit was damaged and required considerable culling. In UTAH, this pest caused more damage than during the preceding 6 years. Fruit injury was greatest to apricots, with general injury to twigs. Peach twig borer was the main insect pest of peaches in COLORADO, with overall damage estimated at 6 percent. Control measures were used,but usually after considerable damage had occurred. Peach twig borer also caused noticeable damage in peach orchards throughout NEW MEXICO during 1961. Local infestations of NAVEL ORANGEWORM (Paramyelois transitella) occurred on peach fruit in Stanislaus County, CALIFORNIA. In TEXAS, heavy infestations of LEAF CRUMPLER (Acrobasis indiginella) occurred on peach and cherry trees in the south central area; EASTERN TENT CATERPILLAR (Malacosoma americanum) was moderate to severe on peach, plum, apricot and apple trees in central and western counties; and FALL

WEBWORM (Hyphantria cunea) attacked persimmon trees in the eastern half of the State. Fall webworm was also more damaging than usual to apple and cherry in OHIO during the 1961 season. Larval populations of YELLOW-NECKED CATERPILLAR (Datana ministra) were apparently more numerous in IDAHO during the 1961 season than in previous years, with reports of defoliation of apples in orchards near Emmett, Gem County, in late July. The pest attacked orchard trees in the Parma area, Canyon County, in early August and caused considerable damage to abandoned apple orchards in the Moscow area, Latah County, during mid-August. In CALIFORNIA, infestations of RED-HUMPED CATERPILLAR (Schizura concinna) were present on prune plantings in varying degrees from Merced County, northward, with young plantings being particularly damaged by defoliation. Also in California, WESTERN TUSSOCK MOTH (Hemerocampa vetusta) was medium locally on prunes in Yolo County. A LYONETIID (Bucculatrix pomifoliella) was more prevalent on apple foliage in abandoned orchards in northern areas of VIRGINIA than in recent years. An unusual outbreak of CANKERWORMS in CONNECTICUT, especially FALL CANKERWORM (Alsophila pometaria), was attributed to weather.

LEAF MINERS destroyed over 35 percent of leaf surface in 2 apple orchards and caused 40-60 percent reduction of leaf surface in several commercial orchards in VERMONT, and localized, heavy infestations of these pests occurred on apple in Westchester County, NEW YORK. Leaf miners were never a problem in treated orchards in DELAWARE during the season, but were prevalent in an untreated block of young apples. These pests were not a problem in the Vincennes area of INDIANA during 1961, nor in KANSAS. Damage by undetermined species of CUTWORMS was less than normal in orchards in Grand, Box Elder, Salt Lake, Utah and Weber Counties, UTAH, but the pests were rather a severe problem in the areas of Quincy, Grant County, and Rock Island, Douglas County, WASHINGTON, causing heavy destruction of buds and partial defoliation in young orchards.

PLUM CURCULIO (Conotrachelus nenuphar) occurred in scattered, but locally heavy, populations in some peach-growing areas of TEXAS during 1961. Heavy populations of the pest were noted on plums and apricots in Payne County and on peaches in Marshall County, OKLAHOMA, with severe damage to peaches noted in localized areas of Oklahoma County. Populations of plum curculio affected more orchards and damaged more fruit during 1961 than in 1960 in ARKANSAS, but populations in MISSOURI appeared to be very light, with noticeable damage occurring only in a few isolated orchards. Injury by plum curculio was not severe in KANSAS, but was slightly above that which occurred during 1960. Injury was readily found in one apple orchard and on isolated plum and peach trees in Doniphan County. In NORTH DAKOTA, injury was reported at Fargo, Cass County, during the season. Plum curculio was present in moderate numbers throughout MINNESOTA, but control was achieved in commercial orchards. This pest, not a major problem in commercial orchards in WISCONSIN, pupated in Door County by August 4. Cool weather occurred in ILLINOIS after plum curculio adults began to appear, which extended the egg-laying period. During 1961, more egg-laying injury occurred in Illinois than is usual. Injury by plum curculio was not severe in the Vincennes area of INDIANA during 1961, but increased when compared with that of 1960. Injury was noticeable in peaches in a few limited spots in commercial orchards in the area. In OHIO, populations of this pest were generally lighter than in 1960 in most commercial orchards, and adults emerged from hibernation about 2 weeks later than usual.

Plum curculio infestations in peaches were comparatively light throughout the 1961 season, as was the case in 1960 in GEORGIA, neither year being as heavy as in 1958 and 1959. There were few reports of "worms" in harvested early peaches, the enforcement of control measures resulting in very good control throughout the season. The hibernating population of plum curculio in the Peach Belt during the winter of 1961-1962 was not greater than that of an average year. Plum curculio caused moderate damage to apples in northern areas of VIRGINIA during 1961 where appropriate controls were omitted early in the season, especially in the petal-fall spray and immediately thereafter. A large second generation developed in the central area of the State, and considerable injury to peach fruit occurred in poorly treated orchards. The pest was unusually light in apple and peach orchards in western MARYLAND; however, some economic injury, apparently from the second brood, occurred on peaches in St. Marys County. In DELAWARE, plum curculio was never a problem in treated orchards during 1961. Adult emergence in NEW JERSEY was spread over a longer period than normal this season, due to a generally cool, wet spring and early summer. Plum curculio was generally at low levels in NEW YORK, which is the average condition in the Hudson Valley. Activity of this pest was lower than average in VERMONT, but it was moderately abundant throughout NEW HAMPSHIRE. Infestations and damage of plum curculio were generally light throughout MAINE during 1961, and some females were found cutting and depositing in mid-June. Severe damage occurred in one relatively localized area of York County, attributed to grower carelessness and a delayed activity period due to erratic temperature changes during oviposition.

APPLE CURCULIO (Tachypterellus quadrigibbus) appeared in a new location in the Champlain Valley of NEW YORK during 1961, and was present in the southeastern part of MINNESOTA. The pest created no serious problem in this latter area, and recommended controls were effective. PLUM GOUGER (Anthonomus scutellaris) severely damaged wild plum fruit at Columbus, Divide County, NORTH DAKOTA, and damaged plums in Sheridan and Prairie Counties, MONTANA, during the season. In NEW MEXICO, no adults, larvae or damaged fruit were found this season where the pest was a problem in native plums in the Rinconado area of Rio Arriba County during 1960.

SHOT-HOLE BORER (Scolytus rugulosus) was prevalent in GEORGIA during 1961 in devitalized, weak or diseased trees, in neglected peach orchards and those damaged by improper use of dormant sprays. There were no reports of serious damage by this pest in OHIO this year, but average damage to home orchards occurred in UTAH. Light to moderate populations of shot-hole borer occurred on prune and other deciduous fruit trees in many locations over CALIFORNIA this past season. Larvae of CALIFORNIA PRIONUS (Prionus californicus) caused root damage in some orchards to cherry and apple trees in Salt Lake, Utah and Davis Counties, UTAH. What was probably FLATHEADED APPLE TREE BORER (Chrysobothris femorata) was responsible for killing approximately 35 percent of the trees in a 40-acre young prune orchard in Yamhill County, OREGON, with many of the remaining trees being injured. PACIFIC FLATHEADED BORER (Chrysobothris mali) caused medium to heavy damage to prune, cherry, peach and apple in many northern counties of CALIFORNIA this season, with young plantings severely damaged. Also in California, heavy populations of a LEAF BEETLE (Luperodes bivittatus) developed on peach in Oroville, Butte County, during May.

GREEN JUNE BEETLE (Cotinis nitida) was present in midseason to late season in MISSOURI, causing some damage to ripening fruit. The population was heavier during 1961 than in the previous 2 years. In GEORGIA, heavy infestations of this pest were present on commercial peaches in the Athens area, Clarke County. Green June beetle usually attacks damaged fruit, but during 1961 the pest attacked firm fruit in this latter area. Also in Georgia, infestations of JAPANESE BEETLE (Popillia japonica) were heavy on several crops in the Dahlonega area of Lumpkin County. This scarab was very abundant throughout VIRGINIA during 1961, with damage to fruit trees reported in many localities. The pest was extremely abundant and damaging in Wythe County.

APHID infestations on fruit were variable over the Nation during the 1961 season. Aphids were particularly numerous and persisted over a long period of time in CALIFORNIA this season, with spotted, medium to heavy populations occurring on prune, pear, plum and cherry in most of the northern half of the State; and were present on fruit in greater-than-normal numbers in NEVADA. An APHID (Anuraphis helichrysi) was heavy locally on plum and prune in Butte County, CALIFORNIA, and was reported common on plums throughout much of southeastern IDAHO during late June. Aphids caused light to moderate damage in MINNESOTA, and populations on apples in MARYLAND were generally light, but various species were more abundant than usual in CONNECTICUT during the 1961 season.

APPLE APHID (Aphis pomi) colony numbers and size began increasing in MAINE during mid-June and reached serious levels by the end of the month. Substantial leaf curling was evident in most areas of the State by July 7 in untreated or poorly sprayed orchards. Vigorous tree growth into late July afforded excellent conditions for population increases of this aphid. An unusual outbreak of apple aphid occurred in orchards in NEW HAMPSHIRE, heavy pruning stimulating vigorous shoot growth in trees, which created favorable conditions for aphid development. Apple aphid was also unusually abundant and required special treatments in many commercial orchards in New Hampshire during 1961. This aphid was also a problem in VERMONT in late June. An unusual outbreak of apple aphid in CONNECTICUT was due partly to weather conditions, and there was some midseason buildup in the Hancock area of Washington County, MARYLAND, on apples.

Damage by apple aphid was generally light in OHIO during 1961, but was noted in practically all apple orchards, even into September, and colonies were abundant during the early part of the season in the Vincennes area of INDIANA. Moderate numbers of overwintering eggs of apple aphid were present in ILLINOIS, but a long, cool season after hatching favored increase before natural and chemical controls were effective. Some widespread light damage did occur before controls were applied. Apple aphid was abundant in MISSOURI in the early spring, and continued troublesome all through the 1961 season. Colonies of this aphid were abundant during the early spring and in September in KANSAS, but damage was light.

Apple aphid was plentiful during the 1961 season in WISCONSIN and caused some economic injury in areas where it was not controlled. Apple aphid was damaging at many locations in UTAH, and was common to abundant in many western areas of IDAHO, with population levels highest during May and June. The pest was particularly abundant in neglected orchards in the southwestern area of the State during the same period. Apple aphid caused light to heavy damage during May and June in Sonoma and Calaveras Counties, CALIFORNIA.

ROSY APPLE APHID (Anuraphis rosea) was generally light in Butte and Sonoma Counties, medium in Santa Cruz County, and heavy in Napa County, on apples, in CALIFORNIA. The pest was much more abundant, widespread and damaging in UTAH than in 1960, and was the most damaging pest of apples in COLORADO during 1961, where it caused 3-4 percent loss of the crop. Populations in Colorado were as high as 30-50 colonies per tree early in the season, with most controls being applied after considerable damage had occurred. Rosy apple aphid was found in practically all orchards in KANSAS, populations being high and damage occurring in the form of curled leaves and stunted apples where control measures were not applied. Moderate numbers of overwintering eggs of rosy apple aphid were present in ILLINOIS. A long, cool season after hatching permitted an increase before natural or chemical controls were effective. Some widespread, light damage did occur before these controls were applied. Rosy apple aphid appeared in relatively large numbers for the second consecutive year in INDIANA where control measures were marginal, and damage to fruit was frequently noted in OHIO, but was below average this season. This aphid was more abundant than usual in PENNSYLVANIA, but natural and cultural controls reduced populations to a nondamaging level. Rosy apple aphid was a threat to fruit early in the season in northern VIRGINIA, but was controlled by appropriate treatment whether before bloom or in the petal-fall application. Damage to untreated trees ranged from light to severe in 1961. The pest was not severe this season in CONNECTICUT.

Light populations of APPLE GRAIN APHID (Rhopalosiphum fitchii) developed on apples in early May at South Kingstown, Washington County, RHODE ISLAND, and very light infestations were present on apple buds in OHIO in early season. Apple grain aphid was abundant during early spring in MISSOURI, but was of little economic importance on apple in COLORADO where a regular treatment program was followed.

GREEN PEACH APHID (Myzus persicae) occurred in light populations on peach and apple trees in CALIFORNIA, but was a problem on peaches throughout NEW MEXICO during the 1961 season. This aphid was noted in early surveys and was a threat to peaches in COLORADO, but, due to extensive dormant and delayed-dormant sprays, the pest was well controlled. Green peach aphid was generally common, though seldom abundant, throughout IDAHO during the past season. BLACK CHERRY APHID (Myzus cerasi) was common in untreated hosts during early June in RHODE ISLAND, and was the most destructive pest of sweet cherries in COLORADO. Losses were estimated at 5-8 percent in the latter State, but controls were effective when begun early, main damage occurring when growers were late with treatment. In CALIFORNIA, black cherry aphid was medium to heavy on cherry trees during May in Marin and Alameda Counties, and locally light in other areas of the State. WOOLLY APPLE APHID (Eriosoma lanigerum) built up to unusually heavy levels in apple orchards in Rio Arriba, Sandoval and Bernalillo Counties, NEW MEXICO, during the summer months of 1961, and light infestations of this pest occurred on apples in Graham and Greenlee Counties, ARIZONA, during April, May and June. Woolly apple aphid was a problem in Marin and Santa Cruz Counties, CALIFORNIA, during 1961, and became quite common on dooryard apple and on pyracantha shrubs. Woolly apple aphid was also damaging in many locations in UTAH during 1961. Fall flights were extremely heavy in the Moscow area of Latah County, IDAHO, during mid-October. Also in Idaho, infestations of MEALY PLUM APHID (Hylopterus pruni) were general in prune orchards near Moscow, Latah County, during early June,and the pest was numerous on prunes in many orchards throughout the southwestern part of the State during the same period. Infestations of mealy plum aphid were general on prunes in Santa Clara County, CALIFORNIA, with heaviest infestations occurring where dormant spray was omitted.

CATFACING INSECTS were about normal in CONNECTICUT during 1961, but damage was high in most orchards in the Vincennes area of INDIANA where improved controls are needed. Catfacing on peaches was about normal in ILLINOIS, as well as in orchards in UTAH, during the season. TARNISHED PLANT BUG (Lygus lineolaris) was abundant and caused some catfacing in several peach orchards in the Salisbury area of Wicomico County, MARYLAND, during the summer, and was present in most orchards in OHIO; but no serious infestations were reported in the latter State. PLANT BUGS were abundant early in the 1961 season on peaches in PENNSYLVANIA, but treatments prevented any damage. Various species of the genera Acrosternum, Euschistus, Leptoglossus and Lygus were more than ordinarily troublesome in MISSOURI, especially in the latter part of May. GREEN STINK BUG (Acrosternum hilare) and several species of Euschistus caused severe catfacing of peaches in INDIANA, with some infestations of Euschistus spp. as high as 45 percent in border rows. Deformed and gnarled peaches, caused by COREID BUGS and STINK BUGS, were not abundant in GEORGIA during 1961. This may have been due to the special controls for sucking bugs used in the early spray season, which were prompted by the heavy infestations of 1959. Damage to ripe fruit in UTAH by BOXELDER BUG (Leptocoris trivittatus) was normal during 1961 in Cache, Salt Lake and southern Utah Counties. In CALIFORNIA, a COREID BUG (Leptocoris rubrolineatus) damaged pears in Mendocino County, and SAY STINK BUG (Chlorochroa sayi) damaged peaches in San Joaquin County. Also in California, heavy populations of another STINK BUG (Euschistus conspersus) developed in untreated peach orchards in the Gridley area of Butte County and were light on peaches in Yolo County; and a LEAF-FOOTED BUG (Leptoglossus sp.) was of considerable concern to homeowners, on deciduous fruits,in many locations of the State.

LEAFHOPPERS varied from numerous to damaging in home apple, plum and prune orchards in UTAH, and, although no serious infestations of these pests were reported in OHIO, APPLE LEAFHOPPER (Empoasca maligna) was observed more frequently during 1961 than in recent years. BUFFALO TREEHOPPER (Stictocephala bubalus) populations were up during late August in VERMONT, and large numbers of the pest were present this season in WISCONSIN, damaging many fruit trees by ovipositing in small twigs. In CALIFORNIA, buffalo treehopper was particularly heavy on pear trees in La Grange, Stanislaus County, but was not a problem in other areas of the State. PERIODICAL CICADA (Magicicada septendecim) appeared in the general areas predicted in VIRGINIA this season. The most extensive outbreaks occurred in Bedford, Botetourt and Rockbridge Counties and the pest was also detected in Augusta, Page, Bath, Alleghany, Shenandoah and Rockingham Counties.

Hot, dry weather, causing honeydew crystallization, destroyed many PEAR PSYLLA (Psylla pyricola) nymphs in the Wenatchee area of Chelan County, WASHINGTON. Control with one of the newer phosphates was good. The pest was more abundant in orchards and more difficult to control in the Yakima Valley during 1961. A high resistance to all materials tested developed in a locality near Yakima, Yakima County, by early August. Heavy infestations of pear psylla nymphs were present in Clark County by mid-June and a severe honeydew problem existed where controls were inadequate. In OREGON, earliest first-brood nymphs of pear psylla were taken in Medford, Jackson County, on May 2, and by May 8 they were transforming to adults. Populations built up in untreated orchards near Medford in July, with control difficult in tree centers where foliage was unusually thick this season. In general, pear psylla was a problem in untreated orchards in the Willamette Valley. Pear psylla now occurs in 29 counties in CALIFORNIA, and during the 1961 season populations varied from light to heavy, with considerable controls being required. Infestations of pear psylla were particularly heavy on pears in the Moscow area of Latah County, IDAHO, during July, and the pest was most abundant in CONNECTICUT, in New Haven and Litchfield Counties, being very common in home orchards.

Summer hatch of APPLE MEALYBUG (Phenacoccus aceris) was underway by early June in MAINE, and, for the most part, infestations were light throughout the State. Natural reduction has returned this pest to normal levels. Populations of apple mealybug were on the decline in NEW HAMPSHIRE, even where only partial control measures were practiced, and were unchanged in VERMONT from those of 1960. There was no evidence of apple mealybug in a NEW YORK orchard during 1961 where it was discovered for the first time in 1960. Undetermined MEALYBUGS occurred on pears in Santa Clara County, CALIFORNIA.

Of the several SCALE INSECTS causing concern during 1961, the most frequently reported was SAN JOSE SCALE (Aspidiotus perniciosus). Extremely heavy infestations occurred in a number of apple orchards in Bernalillo, Sandoval, Rio Arriba and San Juan Counties, NEW MEXICO, during 1961, and the pest is present to some degree in all fruit-growing areas in the State. In CALIFORNIA, there was considerable variation of San Jose scale on deciduous fruit trees in the State, with some infestations persisting even though dormant treatment was applied. First crawlers of San Jose scale appeared in WASHINGTON on cherries in late June, and the species was more generally distributed in Wenatchee area, Chelan County, than usual, with moderate to severe damage. This scale insect caused an estimated 5-percent loss of fruit in Jackson County, OREGON, and was occasionally damaging in several scattered areas of UTAH this season. In WISCONSIN, an infestation was noted in a commercial apple orchard in Sauk County, and the pest was prevalent on fruit trees in southeastern counties. San Jose scale was again extremely light in most orchards in the Vincennes area of INDIANA, much lighter than 10 years ago; however, the pest built up in a test orchard used for replicated spray experiments. Reasons for this increase were not apparent. Infestations of San Jose scale continued light in KANSAS during 1961, although there was a slight increase. The general infestation of San Jose scale in GEORGIA during 1961 was like that of the last 2 years, which was less than that in 1958 or that of an average year. No live specimen was found 4.5 to 7 weeks after the last of 5 applications of a phosphate was applied during the 1961 peach-growing season for the control of plum curculio. Populations of this scale insect were low in commercial orchards in CONNECTICUT this season, but were common in home orchards.

FORBES SCALE (Aspidiotus forbesi) caused concern in only one or two orchards in MISSOURI during the 1961 season, chemical control being very effective. Infestations continued extremely light in most orchards in the Vincennes area of INDIANA, and were much lighter than 10 years ago. Infestations of another SCALE INSECT

(Aspidiotus sp., near pedilanthi) were heavy on apple trees locally in Floyd County, TEXAS. OYSTERSHELL SCALE (Lepidosaphes ulmi) appeared as a problem in MINNESOTA only in neglected orchards during 1961. Infestations of WHITE PEACH SCALE (Pseudaulacaspis pentagona) were heavy on peach trees in the Houston area of Harris County, TEXAS, and on scattered trees in several commercial peach orchards in Dooly, Peach and Crawford Counties, GEORGIA. Medium infestations of ITALIAN PEAR SCALE (Epidiaspis piricola) occurred locally on pears in Santa Cruz County, CALIFORNIA, and populations of OLIVE SCALE (Parlatoria oleae) were present on peach, plum and nectarines in the lower San Joaquin Valley of the same State. There were also a few increases of infestations on peach in the Antelope Valley, Los Angeles County. In other counties of California where olive scale occurs, most infestations are highly local and usually associated with ornamentals. Parasite liberation has resulted in these beneficial insects becoming established and resulting in excellent control in many locations.

Moderate to heavy populations of EUROPEAN FRUIT LECANIUM (Lecanium corni) damaged peach and plum trees in several west central counties of TEXAS, and TERRAPIN SCALE (Lecanium nigrofasciatum) caused concern in only one or two orchards in MISSOURI during 1961, as chemical controls were very effective. A SOFT SCALE (Lecanium sp.) was unusually abundant on prunes in orchards in the Willamette Valley and in Douglas County, OREGON, with some controls being applied.

Initial emergence of APPLE MAGGOT (Rhagoletis pomonella) was delayed to July 14 in MAINE, the latest date during a 29-year record in the State. Peak emergence was reached July 25, and a rapid decrease in early August was followed by a small emergence into September, the last fly being recovered on October 5. Emergence began early in NEW HAMPSHIRE, then declined, with a light emergence for the remainder of the year; occurred in VERMONT from mid-July on, adults still ovipositing on October 23. Fewer adults of apple maggot were observed during September in MASSACHUSETTS than have been seen during the past several years, and appearance of the pest was late in RHODE ISLAND, but was normal for the remainder of the season. Abundance of apple maggot was above normal in some areas of CONNECTICUT during 1961 and was very common in home orchards. Activity of this pest was considerably heavier during 1961 in NEW YORK, with various apple varieties attacked in several orchards in the Champlain Valley. Populations of this fly were generally at low levels in the Hudson Valley. In a few orchards in PENNSYLVANIA, where treatments for apple maggot were neglected, some loss occurred during 1961.

As usual, apple maggot severely infested untreated or poorly treated orchards in OHIO during the year. Infested fruit was noted in some commercial plantings, and flies were taken in cages from July 7 to August 9 and in traps from July 1 to September 8. Second-brood flies were collected in Ohio September 22-26. No survey was conducted during 1961 in the northern area of INDIANA where apple maggot is present. Sticky-board traps distributed in a number of orchards in WISCONSIN indicated that a relatively high apple maggot population existed, but extended over a shorter period than during the 1960 season. Emergence began July 7 in Door County and ended in mid-August in Winnebago County. However, the main emergence was short in duration in most areas by the end of the month. Emergence traps were first placed in major orchard areas of MINNESOTA on July 29-30 and were replaced at 2-week intervals until September 1. The majority of traps were located in neglected or poorly treated orchards. First adults of apple maggot were caught July 11 at La Crescent, Houston County, and at Rochester, Olmsted County. Emergence of new flies continued at a relatively slow rate until mid-August when the largest population occurred, but adults were present in orchards until October 10. Although these traps do not necessarily present a true picture of the total number of flies present in an orchard, they do indicate the presence or absence of adults. Populations in 1961 appeared to be generally lower than during the previous 5 years, which was somewhat unexpected, in view of the fact that high populations had occurred previously and weather conditions for emergence appeared good this season. Despite lower populations, however, neglected orchards had 100 percent of apples infested. Heavy apple maggot populations severely damaged apple fruit in several home and commercial orchards in eastern sections of NORTH DAKOTA, and infestations were general and moderate to severe in noncommercial plantings in northeastern areas of NEBRASKA during the 1961 season. Adults of a CHERRY FRUIT FLY (Rhagoletis cingulata indifferens) first emerged in OREGON on May 21 at The Dalles, May 28 at Hood River and June 2 in the Willamette Valley. However, no fruit loss was reported in commercial orchards in the State during the 1961 season.

PEAR THRIPS (Taeniothrips inconsequens) was common in apple and pear orchards in central Utah during the spring of 1961, and heavy infestations of another THRIPS (Frankliniella occidentalis) were present on apples in Graham and Coconino Counties, ARIZONA, during the same period. Undetermined THRIPS were very numerous during a good portion of 1961 in CALIFORNIA, with light infestations developing on prunes, nectarines and apricots in all commercial growing areas, but damage was probably less than during 1960.

Adults of EUROPEAN APPLE SAWFLY (Hoplocampa testudinea) were observed visiting apple blooms during late May in the Ashway area of Washington County, RHODE ISLAND. An unusual outbreak of this hymenopteron in CONNECTICUT was due partly to weather. The pest was more abundant than usual in the State during 1961 and activity was stimulated by hot days during the bloom period. European apple sawfly increased its range in Middlesex, Essex, Worcester and Franklin Counties, MASSACHUSETTS, and was recorded for the first time in Berkshire County during the 1961 season. The pest was found throughout Ulster and southern Columbia Counties, NEW YORK, representing a renewed northward spread in the Hudson Valley, but was unusually light in Westchester County. PEAR-SLUG (Caliroa cerasi) attacked many orchards in the Willamette Valley of OREGON during 1961, with especially heavy infestations reported from Dundee and Albany. Untreated and nonbearing young cherry and pear trees were also often damaged. This pest was common in many southern areas of IDAHO during late July and early August, and was particularly damaging to some cherry orchards in the Nampa area, Canyon County, and to pear and cherry trees in many parts of the southeast section of the State. Pear-slug caused about average damage to cherry, pear and plum foliage in UTAH during the season. The pest infested prune, pear and cherry plantings in northern counties of CALIFORNIA during the 1961 season. Spotted, heavy populations, probably pear-slug, caused considerable damage to cherry foliage in Rio Arriba and Mora Counties, NEW MEXICO.

EUROPEAN EARWIG (Forficula auricularia) caused heavy damage to peaches in the Manteca area, San Joaquin County, and was genrally damaging to dooryard fruits in many areas of northern CALIFORNIA; and a SNOWY TREE CRICKET (Oceanthus sp.) caused light medium, spotted damage to peach plantings in the Antelope Valley of Los Angeles County, California.

SPIDER MITE populations ranged from light to heavy during 1961 in the United States depending on weather conditions in particular areas, and damage was occasionally severe. Infestations in peach orchards in the Peach Belt of GEORGIA were fewer during the 1961 season than in 1960, with controls required in only a very few instances.

EUROPEAN RED MITE (Panonychus ulmi) caused serious defoliation and "transpiration burn" of pears in Yakima and Wenatchee areas of WASHINGTON during the early summer. Lack of, or improper use of, chemical controls; hot, dry weather during June and July; and increasing resistance to various miticides contributed to heavy damage during 1961. Light populations of European red mite appeared early in 1961 in CALIFORNIA but remained static until summer, when rapid buildup and severe damage occurred. Plums, pears and apples from Santa Barbara County north suffered varying degrees of damage and, because a great range of ornamentals were also attacked, control in commercial plantings was a problem until the occurrence of cold weather and rain. The pest was well below normal in UTAH this season, and moderate infestations occurred on nursery stock at 2 eastern locations in NORTH DAKOTA. European red mite caused no serious damage in MINNESOTA. Eggs of European red mite began hatching in Door County, WISCONSIN, by June 2 and began increasing rapidly during July, with large populations being noted in Milwaukee, Bayfield and Door Counties. Light infestations of this mite occurred in northeastern KANSAS with some population increase noted in September and October, but there was no problem during 1961. European red mite threatened to be a serious problem in MISSOURI during the early part of the 1961 season, but the situation rapidly deteriorated and never became of any serious consequence. European red mite was average for the season in ILLINOIS. Growers who were aware of the problem and attempted controls generally had good results. First indications of resistance of this species to acaricides in Illinois began to appear during the 1961 season. Population development was delayed in INDIANA due to a cool, moist spring. European red mite developed and maintained a heavy fall population pressure in the State into October and during the fruit season required treatment, even on peaches, at 5 to 7-day intervals. European red mite was the number one pest of apple orchards in OHIO during 1961. However, numerous growers had good season control, and it was interesting to note that most growers used early season treatments of oil or other miticides applied before blossoming. This was followed by a schedule that included frequent sprays of miticides applied in 2 successive applications in late July or August. Growers who omitted the early controls were frequently in difficulty Abnormally cool weather during the summer retarded buildup of populations on peaches until mid-September, when most of the fruit had been harvested.

European red mite populations did not build up sufficiently through the early part of the season to cause apparent foliage damage in commercial orchards in the northern area of VIRGINIA during the 1961 season. Populations of this mite were light on apples in western MARYLAND in early season, but increased considerably by midsummer. Infestations on fruit in all sections of the State were above normal during the past season. Generally, excellent control of European red mite was obtained in DELAWARE by following a regular protection schedule, and the pest was a problem in only a few orchards in late summer. European red mite became somewhat of a problem during August in PENNSYLVANIA; however, little difficulty in control was experienced, except in areas where resistance is established. A generally cool, wet spring and early summer in NEW JERSEY resulted in easier control of this mite during May and June, and the population in CONNECTICUT decreased from average levels during 1961. An unusual outbreak of European red mite occurred during August and September in MASSACHUSETTS this season, prolonged heat and drought during August being favorable for development. Populations of this mite were also extremely abundant during August in the eastern area of the State, even where reasonably good control measures were applied. European red mite populations in VERMONT were average, and caused local bronzing; and the pest was present in normal numbers in NEW HAMPSHIRE during the 1961 season. Overwintering eggs of this mite were generally light throughout MAINE in 1961, and summer eggs were found in the Monmouth area of Kennebec County in early June, with hatching underway by June 9. Some injury was evident in late June on apples in scattered locales. Populations of European red mite were normal throughout July in Maine, with heavy egg buildup in late July and early August. Activity continued through August, with heavy populations found on untreated and poorly treated blocks. Populations were moderate to heavy in the Auburn area of Androscoggin County and the Cumberland area of Cumberland County.

An unusual outbreak of TWO-SPOTTED SPIDER MITE (Tetranychus telarius) occurred late in the 1961 season in MAINE, and populations built up rapidly and required special treatments in NEW HAMPSHIRE during August. Populations of this mite were average in VERMONT, but caused bronzing locally. Two-spotted spider mite was unusually abundant in eastern MASSACHUSETTS as a result of prolonged heat and drought during August, even where reasonably good control measures were applied. Populations of this mite decreased from average levels in CONNECTICUT, but were especially abundant in late August and September. Two-spotted spider mite was generally scarce in the Champlain Valley of NEW YORK, and a substantial buildup occurred in only one orchard in Clinton County during the 1961 season. Mites were numerous all through the summer on ground cover, but remained there due to the lush growth.

Two-spotted spider mite was prevalent in many orchards in KENTUCKY from July on, with controls being extremely difficult. Population development in INDIANA was delayed due to a cool, moist spring, but the pest developed and maintained a heavy fall population pressure into late October, and during the fruit season required treatment at 5 to 7-day intervals, even on peaches. In ILLINOIS, more infestations of two-spotted spider mite were reported during 1961, accompanied by drought situations, than were experienced during the past several years. This mite appeared late in MISSOURI and was never of serious consequence during the 1961 season. A slight discoloration of leaves was noted in one orchard in KANSAS during September, where a control program used throughout the season did not include an acaricide. Two-spotted spider mite was not a pest in most orchards in Kansas during 1961, but some bronzing of peach foliage occurred in the Wichita area of Sedgwick County during September and October, after harvest. Two-spotted spider mite was kept well under control on apples in all areas of COLORADO during the 1961 season with the use of miticides. Cool weather retarded development of this mite late in the season, with few controls needed on peaches and being good on pears.

Two-spotted spider mite caused no serious damage in well managed orchards in MINNESOTA during 1961, but moderate infestations did occur in nursery stock at 2 locations in eastern NORTH DAKOTA. A heavy buildup of two-spotted spider mite developed at first cover on pears in the Medford area of OREGON, the earliest in several years in that State. Medium to heavy populations of two-spotted spider mite occurred on deciduous fruit trees during July in CALIFORNIA and continued late into the year. Unusually high temperatures and drying winds caused severe damage before growers were aware of heavy infestations, and too late to treat. Dooryard plantings were severely damaged, causing loss of fruit, heavy defoliation and the occasional loss of a tree.

Heavy populations of PACIFIC SPIDER MITE (*Tetranychus pacificus*) developed in all areas of CALIFORNIA during July and August on apple, peach and pear. Infestations were quite spotted and required more than normal control.

FOUR-SPOTTED SPIDER MITE (*Tetranychus canadensis*) was not numerous in orchards in INDIANA during the 1961 season, although it was present in some instances. The principal area of activity in the State continued to be along the Mississippi River and in the southern portion of the State. Winter survival of this mite in ILLINOIS was very high with damage appearing early in the season, but the pest was generally controlled in the State. The principal area of activity of four-spotted spider mite in MISSOURI during 1961 continued to be along the Mississippi River, similar to that in Indiana, and was in the western portion of TENNESSEE.

Heavy infestations of a FRUIT-TREE MITE (*Bryobia rubrioculus*) appeared on apples in Broadwater County, MONTANA. Controls were used in a few instances on peaches in COLORADO, but populations were at low levels on pears, and the pest was below average in numbers in orchards in UTAH this season, but above during 1960. This fruit-tree mite was a problem on apple and peach trees throughout NEW MEXICO during the 1961 season. Damage to foliage was especially severe in areas where frost killed fruit, and no attempt was made to control this pest. Eggs began hatching in Otero and Lincoln Counties the first week of April and 1-2 weeks later in northern counties. This fruit-tree mite was active on pear, peach and prune in Napa, Yolo, San Bernardino, Butte and San Joaquin Counties, CALIFORNIA, from January to June, but was generally light in occurrence. Other hosts serve as reservoirs for infestations in deciduous plantings.

SPIDER MITES were present on fruit in greater than normal numbers in NEVADA during 1961 and commonly damaged apple and pear orchards in UTAH. Populations of spider mites were held back somewhat in MARYLAND by a late spring, but by midsummer were heavy on apples in all sections. *Tetranychus* spp. developed moderate numbers in only a few locations in northern VIRGINIA during the season, and all mites were less abundant and easier to control in the central area of the State than during the past 2 seasons. *Tetranychus mcdanieli* infested cherries during April in the Wenatchee area of Chelan County, WASHINGTON, and became the most troublesome pest of apples by July, with severe damage in all central apple districts by August. The first record of resistance of this mite to certain acaricides, on cherry, occurred during 1961 in this State. *T. mcdanieli* was highly injurious to many apple and sour cherry orchards in UTAH this season, particularly in Weber, Salt Lake and Box Elder Counties. Spider mite damage throughout the State was conspicuous, but late, especially in apple and pear orchards. *T. mcdanieli* appeared in 2 additional orchards in the Champlain Valley of NEW YORK during the 1961 season.

ERIOPHYID MITES were also of some concern in orchards during the 1961 season. These pests infested foliage near Peru, Clinton County, in the Champlain Valley of NEW YORK, bronzing foliage before spider mites became troublesome. Eriophyid mite injury was generally above average in orchards in UTAH during 1961, and the pests were the common cause of leaf galls on plums throughout the south central portion of MONTANA.

PEAR LEAF BLISTER MITE (*Eriophyes pyri*) increased on apple in Westchester County, NEW YORK, but populations on pears in COLORADO were at a low level during the 1961 season. This mite, along with other species of *Eriophyes*, was normally damaging in a limited number of orchards in Weber, Juab, Salt Lake and Utah Counties and elsewhere in home orchards in UTAH during 1961, and attacked apples in Mineral and Flathead Counties, MONTANA. Pear leaf blister mite was light in many areas of IDAHO during the season and was more prevalent in Bartlett pear orchards in WASHINGTON than for several years, being especially serious on new plantings in the Columbia Basin because of the lack of use of effective post-harvest and delayed-dormant sprays. Local infestations of pear leaf blister mite developed on pears in CALIFORNIA this season, but this eriophyid was probably lower in population density than it has been in past years.

PEACH SILVER MITE (*Aculus cornutus*) populations were average to above average in orchards in UTAH during the past season, and few controls were needed against the pest on peaches in COLORADO. The first record of APPLE RUST MITE (*Aculus schlechtendali*) seriously damaging pears and russeting foliage in WASHINGTON, especially young pear terminals in the Wenatchee River Valley, was made during the 1961 season. The pest was very abundant and injurious by early June on apple, persisting into July in some Wenatchee area orchards, and was unusually abundant during mid-July in the Yakima area, Yakima County, but was controlled. PLUM RUST MITE (*Aculus fockeui*) caused serious damage in 2 prune orchards in Marion County, OREGON, during July. Also in Oregon, PEAR RUST MITE (*Epitrimerus pyri*) caused russeting of leaves and fruits in pear orchards where delayed-dormant sprays were omitted in Hood River County, and was troublesome for the first time in several years in Jackson County, Oregon.

Nut Tree Insects

Highlights: FALL WEBWORM was heavy on pecan and walnut in many areas of Oklahoma and caused more damage than usual in Kansas during 1961. PECAN LEAF CASEBEARER and PECAN NUT CASEBEARER were moderate to heavy on pecan in central and southern Alabama, and the latter pest was damaging in areas of Oklahoma and Texas. A tortricid, *Archips rosana*, continued damaging to filberts in Oregon, and PHYLLOXERAS were heavy on pecan in some areas of Texas and Oklahoma. FILBERT BUD MITE was more abundant than usual in the Willamette Valley of Oregon.

****

FALL WEBWORM (Hyphantria cunea) infestations ranged light to heavy in GEORGIA during the 1961 season, but were lighter than an average year. Infestations of this pest were moderate to heavy on pecan and walnut in many areas of OKLAHOMA, with complete defoliation of trees in isolated areas common in the eastern third of the State. Populations were heavier in some areas of Oklahoma than in the past several years. Fall webworm caused more damage than usual in KANSAS, especially on nonbearing or unsprayed trees. WALNUT CATERPILLAR (Datana integerrima) caused a limited amount of damage to nut trees in OKLAHOMA this season, and Datana sp. attacked pecan and walnut trees in the eastern half of TEXAS. RED-HUMPED CATERPILLAR (Schizura concinna) was present to varying degrees on walnuts in CALIFORNIA from Merced County, northward, with young plantings being particularly damaged by defoliation.

PECAN LEAF CASEBEARER (Acrobasis juglandis) and PECAN NUT CASEBEARER (A. caryae) infestations were moderate to heavy on pecans in ALABAMA during the 1961 season, particularly throughout the central and southern areas of the State. Pecan leaf casebearer was common on pecan trees in central and south central TEXAS during the season. Most infestations of this pest in GEORGIA were light, lighter than in 1959, when some trees were 80 percent defoliated. February examination of buds in Georgia indicated 20-50 percent with hiberniculae. A heavy infestation of pecan leaf casebearer occurred on pecan trees at one locality in Isle of Wight County, VIRGINIA, during 1961. Pecan nut casebearer was light to moderate on pecans in GEORGIA this season, with heaviest infestations occurring in the southern tier of counties. However, some infestations occurred in areas around Waynesboro, Burke County. The second generation of pecan nut casebearer caused unusually heavy pecan losses in the central area of TEXAS. Damaging populations were common in most pecan-producing areas of OKLAHOMA, with up to 70 percent of nut clusters showing some damage in Tillman County. Other counts ranged 1-28 percent damage in the north central, south central and southeast areas of Oklahoma. In NEW MEXICO, damage by pecan nut casebearer in the Carlsbad area of Eddy County was lighter this season than in the past 2 years, except for an area along the Pecos River. Controls by homeowners had only good to fair results. Also in the Carlsbad area, larvae of another PHYCITID (Acrobasis caryivorella) damaged terminals of young pecan trees during the spring.

NAVEL ORANGEWORM (Paramyelois transitellla) infestations were variable in almonds and walnuts in Butte, Sutter, Merced and Kings Counties, CALIFORNIA. The infestation of harvested nuts has been a major problem for the past few years in California. Medium to heavy populations of WESTERN PEACH TREE BORER (Sanninoidea exitiosa graefi) occurred in almonds in Yolo County, and PEACH TWIG MOTH (Anarsia lineatella) caused a great deal of damage to almonds over California this year, the problem persisting all year and requiring control. AMERICAN PLUM BORER (Euzophera semifuneralis) appeared in nut trees in Washington County, UTAH, and, although this pest damaged pecan at Toquerville during 1959, no check was made in this area during the 1961 season.

Infestations of CIGAR CASEBEARER (Coleophora serratella) were general in the southern area of GEORGIA during 1961, but little defoliation occurred. HICKORY SHUCKWORM (Laspeyresia caryana) caused some heavy pecan drop in isolated groves in many areas of OKLAHOMA, with losses estimated up to 50 percent in some groves. Control of FILBERTWORM (Melissopus latiferreanus) appears to have been excellent in OREGON during 1961. Adults first appeared July 3 at Eugene, Lane County, in a blacklight trap, and a few days later appeared in Benton and Washington Counties. CODLING MOTH (Carpocapsa pomonella) was generally light on walnuts in CALIFORNIA during the 1961 season, but a few local, heavy populations did occur.

A TORTRICID (Archips rosana) continued to cause considerable foliage damage to filberts in OREGON during 1961. Fruit set is decreased where controls are not undertaken, and it is not unusual to see 50 percent or more of the leaves curled in April and May.

PECAN WEEVIL (Curculio caryae) was reported in all pecan-producing areas of OKLAHOMA during the 1961 season, with only light numbers observed in most cases, and APPLE TWIG BORER (Amphicerus bicaudatus) infested pecan twigs in the west central area of TEXAS. Moderate to heavy populations of SHOT-HOLE BORER (Scolytus rugulosus) occurred on almond in many locations over CALIFORNIA, and heavy populations of a LEAF BEETLE (Luperodes bivittatus) developed on almond trees in Oroville, Butte County, during May.

APHIDS were of some concern on nuts during the 1961 season. BLACK-MARGINED APHID (Monellia costalis) caused limited damage to nut trees in OKLAHOMA, and infestations on pecans in ARIZONA were heavy in Graham County during the summer and in central and southwestern areas of the State during the fall. Populations of WALNUT APHID (Chromaphis juglandicola) varied considerably in walnut-growing areas of CALIFORNIA, with medium to heavy numbers present in local areas from May through September. Attacks of Monellia sp. on pecans in localized areas of TEXAS were followed by growth of sooty mold. Various aphids were light to moderate on English walnuts in Salt Lake, Weber, Davis, Utah and Washington Counties, UTAH, and were usually moderate in numbers elsewhere in the State on nut trees. Anuraphis helichrysi was also damaging in many locations in Utah during the 1961 season. In OREGON, counts of Myzocallis coryli averaged 10 per leaf in filbert orchards checked on May 17. Increase was slow in development and was terminated by a period of extremely high temperatures in July and August. A rapid increase occurred in August and continued until October. Few orchards in the State are treated specifically for this aphid, but treatments for filbertworm are now effective for this aphid species.

Infestations of PLANT BUGS were general on pecan in GEORGIA from Athens, Clarke County, southward, at about the time nuts were setting. A COREID BUG (Leptocoris rubrolineatus) damaged almonds in Butte County, CALIFORNIA, this past season. In TEXAS, infestations of PECAN SPITTLEBUG (Clastoptera achatina) in pecan trees were common in several south central counties, and infestations of PECAN LEAF PHYLLOXERA (Phylloxera notabilis) were locally severe in pecan-growing areas. PHYLLOXERAS (Phylloxera spp.) were present in heavy numbers on pecans in many areas of OKLAHOMA during the 1961 season. Infestations of OBSCURE SCALE (Chrysomphalus obscurus) on pecan trees were common over most of TEXAS during the season. In OREGON, the effective use of chemicals has curtailed damage by APPLE MEALYBUG (Phenacoccus aceris) in filbert orchards in the mid-Willamette Valley. In CALIFORNIA, almonds in the lower San Joaquin Valley were infested with OLIVE SCALE (Parlatoria oleae), but liberation of parasites has resulted in excellent control of this pest in many locations. Heavy infestations of OYSTERSHELL SCALE (Lepidosaphes ulmi) occurred on walnuts in the Stockton area of San Joaquin County, California, this season.

WALNUT HUSK FLY (Rhagoletis completa) spread in UTAH during the 1961 season, becoming generally damaging throughout Weber and Davis Counties, and infested walnuts in Utah, Salt Lake, Tooele and Box Elder Counties. The trapping program, in which approximately 60 sticky traps were maintained in walnut trees in the Willamette Valley of OREGON, proved negative for walnut husk fly during 1961. Walnut husk fly required control treatment in the southern part of CALIFORNIA, and extended its range in the northern counties of the State during 1961. Adults of a HUSK FLY (Rhagoletis suavis) began emerging near Monroe City, Knox County, INDIANA, between July 28 and August 4, and were still active October 13. In IDAHO, maggots of Rhagoletis sp., probably suavis, were found abundantly infesting English walnuts at Lewiston, Nez Perce County, and especially damaged and caused blackening of husks. FILBERT BUD MITE (Phytoptus avellanae) was more abundant than usual in loose-budded filbert varieties in OREGON during 1961. Filbert growing in the State is restricted to the Willamette Valley.

A FRUIT-TREE MITE (Bryobia rubrioculus) was active on almond in Napa, Yolo, San Bernardino, Butte and San Joaquin Counties, CALIFORNIA, from January to June, but was generally light. Other hosts serve as reservoirs for infestations in almond plantings. Also in California, light populations of EUROPEAN RED MITE

(Panonychus ulmi) appeared early in the season but remained static until summer, when a rapid buildup and severe damage occurred. Damage was variable to almonds and walnuts in Santa Barbara County and northward. Because of the wide variety of ornamentals also attacked by this pest, control in commercial nut plantings was a problem until the advent of rain and cold weather. TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was medium to heavy on almond trees during July and continued late into the year in California. Because of unusually high temperatures and drying winds, severe damage occurred before growers were aware of heavy infestations, and too late to treat. Severe damage occurred to dooryard plantings and caused loss of fruit, heavy defoliation and occasional loss of a tree.

Pests of Avocado, Olive and Fig

Populations of OMNIVOROUS LOOPER (Sabulodes caberata) and of a LEAF ROLLER (Amboria essigana) were very low on avocados in San Diego County, CALIFORNIA, during the 1961 season, with ominvirous looper being considerably below the normal of past years. GREENHOUSE THRIPS (Heliothrips haemorrhoidalis) caused little damage to avocado fruit in San Diego and Santa Barbara Counties, California, this season, and infestations of various THRIPS on this host were light to medium in coastal Santa Barbara County, but required little control due to parasites and predators. An undetermined species of PSYLLID affected avocado in the Ft. Worth area of Tarrant County, TEXAS, and PYRIFORM SCALE (Protopulvinaria pyriformis) heavily infested avocado trees in the lower Rio Grande Valley area of that State. In CALIFORNIA, infestations of a COCCID (Aspidiotus lataniae) were generally light on avocado in Orange County. AVOCADO RED MITE (Oligonychus yothersi) appeared on avocados during February in FLORIDA and was considered to be worse than in several years at Homestead, Dade County. Generally light populations of AVOCADO BROWN MITE (O. punicae) occurred on avocados in San Diego, Orange and Ventura Counties, CALIFORNIA, and biological control was important in keeping this mite under control during 1961.

In CALIFORNIA, AMERICAN PLUM BORER (Euzophera semifumeralis) severely damaged olive grafts in San Diego County, and heavy populations of a COREID BUG (Leptocoris rubrolineatus) that occurred on figs in the eastern foothills of Santa Clara County required controls in September. OLIVE SCALE (Parlatoria oleae) was present on olives in the lower San Joaquin Valley. Parasite liberation has resulted in the establishment of these beneficial insects and control was excellent in many locations.

Pests of Citrus

Highlights: CITRUS RUST MITE continued to be the most troublesome citrus pest in Florida during 1961 and was a problem on citrus in Texas. CITRUS RED MITE was extremely active in California throughout 1961. Population of this pest in Florida during the first quarter of the year was the lowest in 11 years and, after an above-average peak in late June, declined to a record low by September. TEXAS CITRUS MITE infested 76 percent of groves in Florida by the end of June, compared with the previous high of 52 percent, and heavy infestations were 3 times as numerous than in any previous year. The rapid FLORIDA RED SCALE buildup in Florida during late May resulted in high levels which continued above normal through July; and the pest was of concern in Texas. The number of threatening infestations of PURPLE SCALE in Florida was higher during 1961 than the past 2 years. BLACK SCALE was present in 83 percent of citrus groves in Florida by the end of June, with 65 percent of groves having heavy infestations. CALIFORNIA RED SCALE required considerable treatment in local areas of California throughout the 1961 season, and eradicative measures were applied to 3 infestations of this pest in Maricopa County, Arizona. The pest was also of concern in Texas. COTTONY-CUSHION SCALE was occasionally heavy in young groves in Florida during the first half of 1961, and occurrence of this pest in the Rio Grande Valley of Texas apparently increased slightly over that of 1960. BROWN SOFT SCALE was a major problem on citrus in the lower Rio Grande Valley in 1961. APHIDS were particularly numerous in California and persisted for a long period of time.

****

CITRUS RUST MITE (Phyllocoptruta oleivora) continued to be the most troublesome citrus pest in FLORIDA during 1961, being above normal in abundance throughout the first quarter of the year. Although the expected decline occurred in January, an anomalous upward trend resulted in unusually high populations in late March. At that time, 45 percent of groves had economic infestations, compared with a normal of 34 percent. During the second quarter of 1961, this pest presented the major problem to citrus in Florida, in both number and severity of infestations. Infestations were higher during April, May and early June than for those months, in the 10 prior years. A high, statewide population at that period was in marked contrast to the low April to June level in all previous years of record in the State. Citrus rust mite remained of greatest concern to growers during the third quarter of the year, the statewide population being slightly above the 10-year average in July and below in August, then increasing to a high level in September. A majority of groves in all districts in Florida developed damaging populations at some time during that period. Citrus rust mite continued the major citrus pest during the last quarter of 1961, reaching above-average numbers in October and November, then dropping to below-average abundance in December. At peak activity during mid-November, 54 percent of groves had economic infestations of this mite. Citrus rust mite was a problem on citrus in TEXAS during the 1961 season, but populations were reported light on citrus in San Diego, Orange and Santa Barbara Counties, CALIFORNIA.

CITRUS RED MITE (Panonychus citri) was extremely active in CALIFORNIA during the entire year, fluctuating from general light to medium populations to occasional local, heavy populations. Treatment was practiced throughout the year, with citrus-growing areas from Tulare and Santa Barbara Counties south all affected. The citrus red mite population in FLORIDA was the lowest in the first quarter of 1961 of 11 years of record. The pest continued scarce through April, then increased rapidly to a summer peak in late June that was above average. During July, populations declined from the above-average peak and, by September, had declined to a record low level, continuing at the lowest level of 10 years of record for the remainder of the year. Only 10 percent of groves in scattered locations in Florida developed economic infestations of citrus red mite, compared with 25 percent, which is normal for the quarter.

TEXAS CITRUS MITE (Eutetranychus banksi) occurred in moderate abundance during the first quarter of 1961 in FLORIDA, with 5-7 percent of groves having threatening infestations. By the end of June, 76 percent of groves were infested, compared with the previous high of 52 percent. Heavy infestations of this mite were 3 times as numerous than any previous year. Decrease was rapid and reached a low level by mid-August, then increased to a moderate level. At the peak in mid-November, 11 percent of groves in scattered locations in Florida harbored economic infestations, then dropped to low levels for the remainder of the year.

Infestations of SIX-SPOTTED MITE (Eotetranychus sexmaculatus) were at average level in FLORIDA during the second quarter of 1961, but very few damaging populations were noted. YUMA SPIDER MITE (E. yumensis) was light on citrus in ARIZONA throughout the 1961 season. TUMID SPIDER MITE (Tetranychus tumidus), rarely found on citrus, developed a moderate infestation in one untreated orange grove near De Land, Volusia County, FLORIDA, in February.

Populations of CITRUS FLAT MITE (Brevipalpus lewisi) were light on citrus early and late in the 1961 season in local areas of San Bernardino County, CALIFORNIA, and light on citrus in Maricopa and Yuma Counties, ARIZONA, during the fall. A FALSE SPIDER MITE (Brevipalpus sp.) was more abundant than average during the last quarter of 1961 in FLORIDA, with 21 percent of groves infested; however, no damage was detected.

In CALIFORNIA, light, spotted infestations of CITRUS BUD MITE (Aceria sheldoni) occurred on coastal citrus in Santa Barbara County during the 1961 season.

FLORIDA RED SCALE (Chrysomphalus aonidum) populations decreased to relatively low levels during the first quarter of 1961 in FLORIDA, which is normal for the period. Economic infestations were present in about 7 percent of the groves. Populations were average until late May when a strong buildup to high level began, and the pest continued above normal in abundance through July, then dropped slightly below average. Although this pest was widespread during the last quarter of the year in Florida, as is usual, the number of economic infestations was below average, with 59 percent of groves infested. Florida red scale was of concern in the citrus-growing area of TEXAS during 1961 also.

PURPLE SCALE (Lepidosaphes beckii) remained at the low levels of 1960 during the first quarter of 1961 in FLORIDA, except for an increase in late March that resulted in 9 percent of groves having important infestations. This increase continued through June when the pest was present in 90 percent of groves, but most infestations were very light. The number of threatening infestations was higher than in the past 2 years. Populations of purple scale reached a moderate peak during July, but, by late August, natural control had reduced the population to the lowest level on record. By the last quarter of the year, this pest was present in more groves (85 percent) than in the last quarter of any year since 1958; however, less than one percent of groves harbored heavy infestations. In CALIFORNIA, light infestations of purple scale occurred on citrus in Orange and San Diego Counties during the 1961 season.

CHAFF SCALE (Parlatoria pergandii) was found infesting commercial citrus in San Diego County, CALIFORNIA, and caused concern in the citrus-growing area of TEXAS during the 1961 season. Chaff scale levels were higher in FLORIDA in March than in 11 prior years, but were not important, and remained so until June when 65 percent of groves were infested. The population then was higher than in previous years. The level remained higher than normal for the remainder of 1961 in Florida, but the pest was of little importance.

Infestations of BLACK SCALE (Saissetia oleae) were at a higher level in March than during 11 prior years in FLORIDA, but the pest was not important. The population was above average during April, then increased rapidly in May, reaching the highest level on record in the State. By the end of June, black scale was present in 83 percent of groves, with 65 percent of groves having heavy infestations. The pest continued well above average throughout September and was responsible for heavy growth of sooty mold. Prolonged warm weather during November and December in Florida permitted a third brood to hatch, although it was of no immediate importance. Populations of black scale were generally light in all citrus areas of CALIFORNIA during 1961 and biological control was excellent. Unfavorable weather, restricting parasite action, made chemical control necessary until parasites were again present in sufficient numbers to exert control.

GLOVER SCALE (Lepidosaphes gloverii) and YELLOW SCALE (Aonidiella citrina) were both more abundant in FLORIDA during 1961 than in the past 11 years, but were of little importance during the year. In CALIFORNIA, generally light populations of yellow scale were present on citrus in Tulare, Yolo and Butte Counties this season.

CALIFORNIA RED SCALE (Aonidiella aurantii) varied considerably in CALIFORNIA during 1961, with considerable treatment required in local areas from January to December. Medium populations of this pest were present in the State from June through October. In ARIZONA, eradicative measures were applied to 3 infestations of California red scale in Maricopa County during the season, and the pest caused concern in the citrus-growing areas of TEXAS this year.

FERN SCALE (Pinnaspis aspidistrae) was more abundant in FLORIDA this year than in past 11 years during January through September, and populations of a LESSER SNOW SCALE (P. strachani) were above normal during the last quarter of the year. Both scales were of little importance. Also in Florida, a SNOW SCALE (Unaspis citri) was more abundant than usual during the third quarter of 1961, but did not become important until November and December when a number of serious infestations developed in Lake and Orange Counties.

Occasional heavy infestations of COTTONY-CUSHION SCALE (Icerya purchasi) in young groves occurred during the first half of 1961 in FLORIDA, but infestations were below average in abundance during the remainder of the year. The occurrence of cottony-cushion scale on citrus in the Rio Grande Valley of TEXAS during 1961 was apparently slightly increased over that of 1960. No commercial citrus plantings in CALIFORNIA were infested with this pest during 1961, but occasional dooryard citrus trees over the State were infested. A series of mild winters has allowed vedalia (Rodolia cardinalis) to survive in California.

FLORIDA WAX SCALE (Ceroplastes floridensis) populations were above normal in FLORIDA during the second quarter of the year, but were of little importance.

BROWN SOFT SCALE (Coccus hesperidum) was a major problem on citrus in the lower Rio Grande Valley of TEXAS during 1961, and was below average abundance during the third quarter of the year in FLORIDA. In ARIZONA, a few light infestations of CITRICOLA SCALE (C. pseudomagnoliarum) occurred on citrus in Maricopa County. A heavy population of PYRIFORM SCALE (Protopulvinaria pyriformis) developed during the second quarter of 1961 in a mature grapefruit grove in FLORIDA, but populations of the pest in all districts of the State did not develope above normal until the last quarter of the year, at which time it was of minor importance.

CITRUS MEALYBUG (Pseudococcus citri) required occasional chemical control in CALIFORNIA during the 1961 season, but, in general, has been well controlled biologically in the coastal citrus-growing areas of the State. Populations of MEALYBUGS increased from normal level in FLORIDA during April to above-normal abundance in June, but few infestations were heavy. Populations of these pests again increased temporarily to above-average level in November.

Medium to heavy infestations of MELON APHID (Aphis gossypii) occurred from March to July on citrus in Orange County, CALIFORNIA. Other citrus areas in the State did not experience the heavy populations of past years, and a fungus disease was an important factor in controlling this aphid in California during 1961.

APHIDS were particularly numerous in CALIFORNIA during the 1961 season and persisted for a long period. Light to medium populations of these pests occurred on citrus in Ventura, Orange, Los Angeles, San Diego and Riverside Counties. In FLORIDA, new growth in citrus orchards began later than usual (mid-February), and expanded rapidly. This situation contributed to the lowest spring population of aphids on record in the State, and populations remained low throughout the year.

CITRUS THRIPS (Scirtothrips citri) populations persisted from March to October in most citrus areas of CALIFORNIA, and light to severe infestations of this pest were particularly bad during August and September. Light, but general infestations of citrus thrips were present in Maricopa and Yuma Counties, ARIZONA, on citrus in late May and increased to an average of 60-90 per 5 terminals in many groves; however, control measures were very successful in protecting young fruit in most instances. Infestations of 6-8 per terminal were common on young citrus throughout the summer in Arizona and considerable foliage damage was evident.

CITRUS WHITEFLY (Dialeurodes citri) infestations were heavy in home citrus orchards in the south central area of TEXAS during 1961, and a few light infestations of MULBERRY WHITEFLY (Tetraleurodes mori) were present on citrus in Yuma and Maricopa Counties, ARIZONA.

FRUIT-TREE LEAF ROLLER (Archips argyrospilus) developed light to medium populations on citrus in the southern half of Tulare County and in the Northridge area of Los Angeles County, CALIFORNIA, during the 1961 season, and WESTERN TUSSOCK MOTH (Hemerocampa vetusta) was light on citrus in San Bernardino and Riverside Counties. A light population of a PEEL MINER (Marmara sp.) mined the peel of grapefruit, oranges and lemons in Yuma and Maricopa Counties, ARIZONA.

KATYDIDS caused medium damage to citrus plantings in the San Fernando Valley and trace to light damage in western Riverside County, CALIFORNIA, and ARGENTINE ANT (Iridomyrmex humilis) was active a major part of 1961 and required control treatments in citrus groves in southern California.

Pests of Grape

Highlights: A new infestation of WESTERN GRAPE LEAF SKELETONIZER found in Fresno County, California, during 1961. The pest was heavy on home plantings of grapes in Arizona during the summer and fall, and caused considerable damage in some instances in Dona Ana County, New Mexico, during July. GRAPE MEALYBUG required stringent controls in Washington and LEAFHOPPERS were generally heavy on cultivated grapes in areas of Nevada and required controls in areas of California. GRAPE ROOT BORER was perhaps the outstanding fruit pest in Missouri during 1961. GRAPE CANE GALL MAKER caused considerable injury to grape plantings in Indiana again in 1961, and ARMY CUTWORM caused considerable defoliation of grapevines in 3 northern California counties. Also in California, SPIDER MITES were heavy and required controls.

****

A new infestation of WESTERN GRAPE LEAF SKELETONIZER (Harrisina brillians) was found in CALIFORNIA at Kerman, Fresno County. This infestation in dooryard grapes and Virginia-creeper is very limited; no commercial grapes were found infested. Eradicative treatments were applied and survey was continual. The only other area where this pest occurs in California is a limited area in San Diego County. Adults of western grape leaf skeletonizer emerged and mated the first week of May in NEVADA, with eggs and first instars present by mid-May. This pest is still confined to one area of Las Vegas, Clark County, and eradicative measures were initiated against it during the 1961 season. Parasites and predators almost completely controlled western grape leaf skeletonizer in Washington County, UTAH, this season. Heavy infestations of this pest damaged untreated dooryard grapes during the summer and early fall in ARIZONA, and eggs and larvae were abundant in home plantings of grapes in the Las Cruces area of Dona Ana County, NEW MEXICO, during July, with considerable damage in some instances.

Infestations of GRAPE LEAF SKELETONIZER (Harrisina americana) were light and local in GEORGIA this year. In the grape-growing area of Erie County, PENNSYLVANIA, special treatments were applied to prevent damage by RED-BANDED LEAF ROLLER (Argyrotaenia velutinana), and fair numbers of VARIEGATED CUTWORM (Peridroma saucia) fed on grape during October. GRAPE LEAF FOLDER (Desmia funeralis) attacked grapevines locally in VIRGINIA this season; and infestations were generally light and spotted on grapes in CALIFORNIA, being found primarily in San Joaquin Valley vineyards. GRAPE ROOT BORER (Vitacea polistiformis) infestations were generally on the increase in ARKANSAS, and this species was perhaps the outstanding fruit pest in MISSOURI during the 1961 season. Typical symptoms of attack appeared on grapes about the first of June in the Steelville area of Crawford County and the Rosati area of Phelps County, Missouri. GRAPE BERRY MOTH (Paralobesia viteana) damaged grapes in a few vineyards in Washington County, UTAH, this season. The pest was less severe in ARKANSAS during 1961 than during 1960, and no severe attack developed during the season in MISSOURI. A light infestation of grape berry moth developed in the grape-growing area of Erie County, PENNSYLVANIA. In CALIFORNIA, considerable defoliation of grapevines was caused by ARMY CUTWORM (Chorizagrotis auxiliaris) in Napa, Sacramento and Amador Counties, and light to medium populations of undetermined CUTWORMS damaged grape vineyards in San Bernardino and Fresno Counties.

A stringent control program was necessary against GRAPE MEALYBUG (Pseudococcus maritimus) in WASHINGTON during the 1961 season, but only a few grapes were rejected by processors because of the pest. Eggs were hatching in June in the Yakima Valley and crawlers began depositing honeydew on grapes by late July. However, this was not serious in the Yakima Valley because extremely dry weather dried the honeydew and retarded growth of sooty molds. Grape mealybug populations varied with control practices in CALIFORNIA during 1961, ranging light to heavy in San Joaquin, Merced, Fresno and Tulare Counties; and undetermined MEALYBUGS were present on grapes in Stanislaus County. Only light populations of a MEALYBUG (Pseudococcus sp.) appeared in MISSOURI this season and were easily controlled. Infestations of GRAPE SCALE (Aspidiotus uvae) continued on the increase generally in ARKANSAS this season. GRAPE PHYLLOXERA (Phylloxera vitifoliae) appeared in the West Hartford area of Hartford County, CONNECTICUT, during the season. Populations of LEAFHOPPERS (Erythroneura spp.) were generally heavy on cultivated grapes in Churchill, Clark and Nye Counties, and on wild grapes in Clark County, NEVADA. Erythroneura spp. were present from March to October and required considerable control work in Riverside, Tulare, Napa and Kern Counties, CALIFORNIA. Light to medium infestations of these pests were a problem on some grapes during the spring of 1961 in ARIZONA, and the pests caused noticeable damage to grapes in Dona Ana County, NEW MEXICO. SPITTLEBUGS damaged grapes in a few vineyards of Washington County, UTAH, this year.

JAPANESE BEETLE (Popillia japonica) was very abundant throughout VIRGINIA during the 1961 season, damaging grapes in many localities, and another SCARAB (Pelidnota punctata) attacked grapevines locally in the State. Light to moderate populations of still another SCARAB (Hoplia sp.) damaged grapes in vineyards in Lodi, San Joaquin County, CALIFORNIA. A POWDER-POST BEETLE (Lyctus sp.) was found boring in stems of grapevines in the Billings area of Yellowstone County, MONTANA, in March. Determination was made by D. M. Anderson. Larvae and adults of GRAPE FLEA BEETLE (Altica chalybea) caused conspicuous foliage injury to grape plantings in Allegany and Frederick Counties, MARYLAND; a FLEA BEETLE (Altica torquata) and another LEAF BEETLE (Glyptosceles sp.) were present in light to moderate numbers on grapes in Clark County, NEVADA. Medium populations of A. torquata also developed on grapes in Escondido, San Diego County, CALIFORNIA. BLACK VINE WEEVIL (Brachyrhinus sulcatus) damage to grapevines was moderate in the lower Yakima Valley of WASHINGTON by late June, causing grapes to drop by late July. Losses ranged 2.4-3.4 tons per acre with different cover crops in experimental plantings. GRAPE CANE GALL MAKER (Ampeloglypter sesostris) caused considerable injury to many grape plantings in INDIANA during 1961, as it did in 1960. A GALL MIDGE (Lasioptera vitis) appeared occasionally throughout RHODE ISLAND after mid-July. In all areas of CALIFORNIA, heavy populations of PACIFIC SPIDER MITE (Tetranychus pacificus) developed on grapes during July and August. Infestations were quite spotted and required more than normal control. Also in California, medium to heavy populations of a SPIDER MITE (Eotetranychus willamettei) were particularly damaging to grapevines in San Joaquin, Fresno and Napa Counties.

Pests of Bushfruits

BLACK-HEADED FIREWORM (Rhopobota naevana) was general and often serious throughout the coastal cranberry-growing area of OREGON during the 1961 season. Eggs were first noted at Bandon, Coos County, on April 6. First-brood larvae were abundant in many bogs by April 23 and infestations were observed in all areas by May 21. Haphazard control programs accounted for most of the 1961 production losses in Oregon. Heavy infestations of black-headed fireworm were present in unattended cranberry bogs in Grays Harbor County, WASHINGTON, this season.

Larvae of STRAWBERRY CROWN MOTH (Ramosia bibionipennis) damaged canes of red currant at Huntington, Emery County, and dewberries at Providence, Cache County, UTAH, during the 1961 season. CURRANT APHID (Capitophorus ribis) and other species generally were moderate, with normal, conspicuous injury present on red currant foliage in the State. PSYLLIDS were seldom severe on currants in Utah during 1961, and infestations of CURRANT FRUIT FLY (Epochra canadensis) were general in black and red currants in the State during the season.

Emergence of BLUEBERRY MAGGOT (Rhagoletis pomonella) in MAINE was underway on June 30 in Jonesboro, Washington County, and was essentially completed by July 21. Infestations in most areas of the State were generally lower during 1961 than they were for the previous year. BLUEBERRY THRIPS (Frankliniella vaccinii) is becoming more prevalent in Hancock and Washington Counties, Maine, and heavy populations caused severe damage to blueberries in many areas of the State this season. A substantial buildup of a BLUEBERRY FLEA BEETLE (Altica sylvia) occurred in many areas of Washington County this year. In CALIFORNIA, medium populations of a FLEA BEETLE (Diachus auratus) attacked bushberry plantings in the Watsonville area, Santa Cruz County. SAY STINK BUG (Chlorochroa sayi) was also present and damaging to bushberries locally in Santa Cruz County; a LEAF-FOOTED BUG (Leptoglossus sp.) was of considerable concern to homeowners, on bushberries, in many locations in California; and REDBERRY MITE (Aceria essigi) was heavy statewide where early control was not practiced or was not adequate. BUD MITES were very abundant on Wolcott variety of blueberry in Bladen County, NORTH CAROLINA, during the spring months.

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D. C.

Official Business

POSTAGE AND FEES PA